

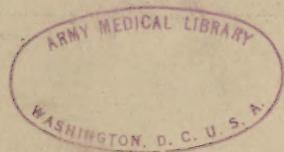
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Handbook of **PHYSICAL TRAINING**

FOR USE IN
REHABILITATION PROGRAM
OF THE MEDICAL DEPARTMENT, U.S.NAVY

NAVMED 956



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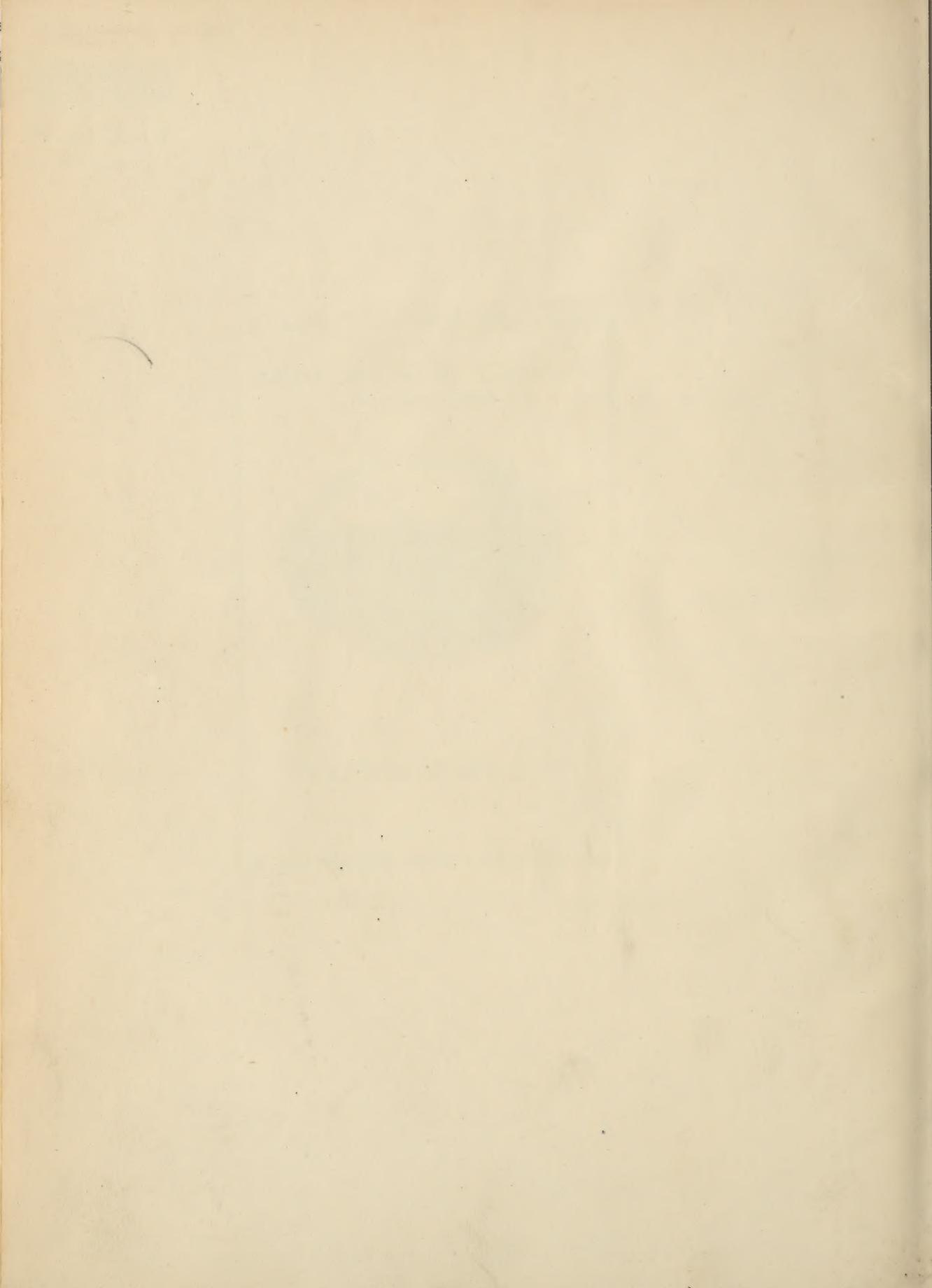
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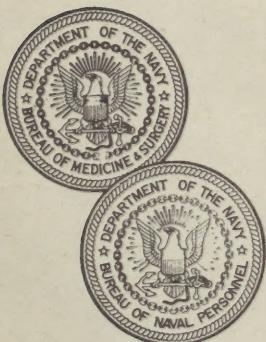


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Handbook of **PHYSICAL TRAINING** for use in **REHABILITATION PROGRAM** of the Medical Department, **U.S. Navy**

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Personnel, Navy Dept.
Washington, D.C.



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INTRODUCTION

Physical training, as a part of the medical officer's armamentarium, is a relatively new concept. Its benefits are sociologic and psychologic as well as physiologic. Properly prescribed and administered, physical training activities improve muscle tone, increase respiratory and vascular efficiency, and stimulate general metabolism. Prescribed remedial or corrective exercises can contribute to the amelioration of certain specific disabilities. Participation in games and sports, results in a feeling of group-fellowship and satisfaction from successful accomplishment, as well as a certain degree of self-confidence and security.

In order to facilitate the administration of physical training it is necessary to classify patients into groups which will indicate their ability to engage in physical activities. The physical training activities for each group must be prescribed or approved by the medical officer on the basis of personal needs. The special training and technical knowledge of the physical training officer should be utilized in devising and suggesting specific exercises, sports and games of value in the treatment of specific conditions.

In order to enable the physical training instructor effectively to carry on his work it is essential that he is apprised regularly of the patient's condition by the medical officer. This evaluation of the patient's condition should be made periodically and should include data concerning diagnosis, indications and contraindications for exercise, the

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apparatus to be used, and any other information of value to the physical training instructor. Alterations in the exercise routine may be made by the medical officer as the progress of the patient indicates. A patient may be changed to another group or retained in his present group as the medical officer deems advisable.

It will be the duty of the physical training officer to inform the medical officer should any selected activity seem inappropriate for the patient. A definite system should be set up whereby the physical training officer can supply the medical officer periodically with data relative to physical progress.

Physical training activities for patients will differ in various ways from those for normal persons. However, the activities prescribed by the medical officer must be so conducted as to obtain the results desired from these activities.

Physical training should be a planned, continuous and progressive procedure started as soon as the patient has been classified as group 4 by the ward medical officer. Patients in group 4 are least likely to participate in exercise of their own accord and are the ones most in need of physical training. The extent of their participation, consequently, may well be used as a criterion in evaluating the success of the total physical training program. However, the final success of the program is measured by the percentage of participation in all active groups.

In order to secure the maximum benefits from prescribed physical training activities, an adequate time allotment is necessary and should be included in the hospital routine.

PREFACE

The physical fitness of its personnel is of fundamental importance to the Navy. A carefully planned and administered total fitness program, designed to prepare recruits for the rigors of Naval warfare, is in force at all training centers. Moreover, efforts are being made to maintain total fitness once it is achieved. It is inevitable that Navy men occasionally are wounded or become ill. At such times deconditioning takes place rapidly, and a long period of convalescence may be necessary to bring the patient back to normal health.

Physical training has been included in the Rehabilitation Program as one means of preventing this deconditioning and overcoming it when present.

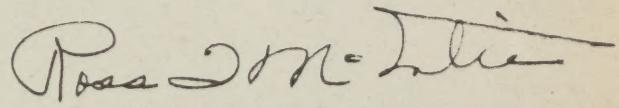

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PART I. THE PHYSICAL TRAINING PROGRAM

Physical training, as an integral part of the total rehabilitation program, should possess uniformity of content and procedure, not only in the various naval hospitals but in different wards of the same hospital in order that when patients are transferred there will be a minimum break in continuity.

The principles which should guide physical training personnel in effectively carrying out their part of the rehabilitation program are given in the following.

Calisthenics

The therapeutic value of properly prescribed calisthenics has been recognized for many centuries. Simple body movements can be performed by the bed patient to prevent loss of muscle tone. The ambulant patient can be given exercises to develop strength, endurance, and coordination. In some instances exercises can be prescribed to aid in the amelioration of specific defects or disabilities. The dosage of work desired can be prescribed in accordance with the patient's capacity.

Gymnastics

The therapeutic value of gymnastics is considered of paramount importance, and does not stress the development of a few star performers. Tumbling stunts, for example, are taught for the purpose of improving the patient's balance, agility, flexibility, and strength. Chest weights are used to overcome specific muscular deficiencies. Rope-skipping is

used to develop foot and leg muscles as well as to improve cardiorespiratory efficiency. Weight-lifting is utilized with no thought of making professional strong men, but to overcome specific muscular weaknesses and, in some instances, to develop strength in an area following injury or operation.

In certain situations, it may be possible to set up "Ship Activity Training." These activities might involve the use of apparatus such as steep ladders (to engine room, up masts or trunks), simulation of narrow hatchways and water-tight doors, with simulation of coamings of appropriate heights and small passages and trap-doors, such as lead into some turrets; ropes with knots for getting over the side, and cargo nets for similar purpose.

These are activities which many or all naval personnel may be called upon to participate in at some time. Many of them require movements not frequently used in ordinary life, especially in a hospital.

This type of activity should be carefully used only with selected group one patients in order to avoid injuries.

Aquatics

Prescribed water-resistive and water-borne exercises are especially beneficial for orthopedic patients and have a desirable sedative effect for the neuropsychiatric. Swimming and other aquatic activities afford a desirable form of general body exercise as well as a pleasing form of therapy, which is enjoyed by many patients. Every advantage should be

taken of the opportunity to teach the fundamentals of swimming as well as life-saving skills wherever local conditions permit.

Sports and Games

There is a special interest inherent in sports and games. They are included in the program not for the training of a few highly skilled performers, but for the development of strength, endurance, and neuromuscular coordination. Group activity should be the ultimate goal. Since many patients have not had an opportunity to develop skill in sports, fundamental skills should be stressed for their safety and interest-provoking values. We are inclined to repeat those things which we do well.

Since success is stimulating and failure is depressing, sports and games will be most valuable when each participant achieves a reasonable amount of success. Softball has for its objective, hitting the ball. Therefore, the pitch should be delivered with the idea of making it easy for the batter to hit the ball. In this way many runs are scored, and many who previously did poorly in the game then experience success. As a result, they develop self-confidence and experience the satisfaction of group recognition and social approval.

Games and sports which are relatively safe should be chosen rather than the more dangerous ones. Thus, volleyball should have preference over basketball except for the more vigorous men in group one. However, separate sports skills of the more rugged games should be used whenever feasible, e.g., shooting baskets.

The socializing benefits of sports and games should be stressed. In games one may learn to play with rather than against other persons. The fundamental urge for satisfying activity can be gratified through participation in games and sports. Through these activities many emotions find suitable expression along conventionally accepted lines. The worried individual, finding himself engrossed in a satisfying activity, temporarily, at least, forgets his troubles. Often success in sports may balance failure in other areas of human experience.

Combatives

The use of boxing and wrestling in the rehabilitation program is for the purpose of developing alertness, coordination and self-confidence. The recreative phase of combatives should also be stressed with hospital patients, but the physiologic benefits should not be overlooked. Little emphasis is given to their inherent life-saving values.

Remedial Exercises

Individual Repetitive Exercises:

In order to accelerate the patient's recovery a few minutes of each waking hour may be devoted to repetitive exercises. These exercises should be prescribed by the medical officer for war patients and usually include (1) one or two exercises for a specific body part (such as "quadriceps setting" to improve the muscle tone of the quadriceps extensor muscles), (2) a foot exercise to overcome the weakness in the legs and feet, and (3) a posture exercise to offset the faulty posture

which frequently accompanies hospitalization.

Each patient in the ward may have different exercises prescribed for his specific needs and taught him by the physical training instructor. The need for performing these exercises should be explained, and the patient urged to use his free time for self-improvement. A recommended procedure is for all patients to begin their repetitive exercises at a certain time each hour under the leadership of the physical training instructor or of someone within the ward to whom this duty has been delegated. Where prescribed the repetitive exercises should be conducted by the physical training instructor.

Group Remedial Exercises:

Many patients who are able to leave their wards and who have specific disabilities for which the medical officer has prescribed special remedial exercises may be given these exercises as a group by the physical training instructor in a small remedial exercise room or in some part of the hospital where they will not interfere with other patients. These exercises follow the pattern of the repetitive individual exercises in that they are intended to alleviate a specific weakness or disability, and improve posture.

These exercises are supplementary to the regular calisthenic exercises and should be conducted in small homogeneous groups. In many instances stallbars, chest weights, stationary bicycles, rowing machines or apparatus of this type may be used for the relief of specific disabilities.

"Cart Activities"

Many ward-bound patients will benefit from the use of certain gymnastic equipment which may be brought into the ward on the exercise cart. When approved by the medical officer these activities include exercises with light gear such as:

dumbbells, Indian clubs, light medicine balls, weights, spring (hand-grip) exercisers and manuometers, chest expanders, and rubber balls for weak hands and fingers.

Miscellaneous Outdoor Activities

In addition to the aforementioned activities, many others may be included in the physical training program as local conditions permit. Fishing, bait- and fly-casting, surf bathing and boating are possible in certain areas. Winter sports, such as skating, tobogganing and skiing, may be used where available. Hiking with a planned objective, such as visiting places of scenic beauty or historic significance, provides a desirable physiological stimulation and is rich in educational possibilities. The possibility of seeing places of interest often motivates the patient to participate in the hike with enthusiasm which is not present during the ordinary "road march." The aid of someone who knows nature and can guide the patients in the development of an appreciation of its various phenomena can make hiking the high light of the day's activity.

Bicycling and horseback riding are valuable not only as desirable leisure-time activities but are useful in getting patients out of doors where they can more readily receive the benefits of fresh air and sunshine. Physical training personnel should explore the possibilities

for the utilization of all available facilities in the vicinity of the hospital if they are to take full advantage of the opportunity for the development of a well-rounded physical training program.

Classification of Groups

The following classification of patients, based on their ability to participate in physical activity, will facilitate their assignment to physical training by the ward medical officer and will guide physical training personnel in their work.* This classification, which should be made as soon as possible after the patient enters the hospital, is as follows:

Group 5

This group includes patients for whom the medical officer considers exercise to be contraindicated.

Group 4

This group is made up of patients who are confined to bed and whom the medical officer considers limited exercise indicated. Physical training activities in general for this group should be directed toward the prevention of deconditioning of the unaffected parts of the body and the indoctrination of these patients with the desire for self-improvement and the will to recover. Remedial exercises or other activities for the affected part may be conducted only on prescription of the medical officer.

* Some system of identification may be used for the various groups such as red cards for group 5, amber for group 4, and green for group 3.

These prescribed individual repetitive remedial exercises should be given hourly during each waking hour of the patient's day.

In order to prevent deconditioning of the unaffected parts of the body two fifteen-minute periods of group 4 exercises should be scheduled daily. The appropriate exercises should be selected from those illustrated in Part II, for group 4 patients. The basic group 4 exercise list contains suggested alternative exercises, but any additional alternatives which the medical officer wishes the patient to perform may be added.

Group 3

This group is made up of patients who are well enough to spend the greater part of their waking hours out of bed, but who are still confined to their wards. These patients may be free to leave the ward for mess and for remedial exercises, physiotherapy, occupational therapy and other clinical appointments. Physical training activities for this group should include special emphasis on the maintenance of a high level of fitness of the unaffected parts of the body and on the amelioration of the affected part or parts. Short periods of suitable adapted recreational physical training or group remedial exercises may be prescribed to supplement the regular calisthenic exercises for group 3 patients. Two thirty-minute periods scheduled daily should be appropriate for the physical training activities prescribed for this group.

Group 2

This group includes patients who are ambulant but who still have

certain restrictions imposed on their activities. Physical training activities for this group should be largely general conditioning activities (calisthenics, gymnastics, aquatics and games) which are within the patient's capacity. Attention should also be given to the amelioration of any existing defect or disability. For patients who are to be surveyed from the service, emphasis should be placed on improving their total fitness in order that they may return to civil life with the least possible handicap from their disabilities.

A vigorous physical fitness program should be stressed for those patients whose prognosis indicates that they will return to duty. Two hourly periods or one two-hour period of supervised physical training daily for group 2 patients is considered appropriate in addition to scheduled work details.

Group 1

This group is made up of patients who have few if any restrictions on their activities. As these men should be returning shortly to duty, it is important that their physical training program should develop strength, endurance and body coordinations in order that they will be able to carry on the work to which they are to be assigned. Their physical training activities must therefore be vigorous and prolonged. In addition to scheduled work details for this group, three hours of supervised physical training is considered optimum to develop their total fitness for full duty.

Physical Training for Neuropsychiatric Patients

Inasmuch as most disabilities have their psychosomatic counterparts, it becomes advisable for all those dealing with hospital patients, to become familiar with the principal symptoms of the common mental disabilities and with the accepted procedures used in dealing with neuropsychiatric patients, even though they are not directly concerned with the more technical aspects of treatment.

There is a tendency in these patients to withdraw from participation in any group activities as well as from all activities, group or individual, which involve vigorous physical activity. The primary object of physical training, therefore, for neuropsychiatric patients is to amplify the daily program of activity and stimulate the patients' interest in concrete pleasurable things outside himself. Secondary values accrue to a well-planned program in the improvement of their general physical fitness through directed physical exercise. Certain minor complaints, not associated with any organic ailment, often disappear following improvement in physical fitness.

Psychiatric patients, by and large, are less physically active in a socially constructive sense, more inclined toward a sedentary type of recreation, prone to isolate themselves to a greater degree than better adjusted persons and thus on the whole are less socially minded, less gregarious and less outgoing in their physical expressions.

Physical training can round out this relatively less developed aspect of their personalities by making active participation attractive.

It can stimulate latent interest in athletics and thereby give the person an opportunity to practice one kind of social competition in which there are tangible rewards for everyone.

A varied program is essential, not only in order to avoid monotony and boredom but positively to sustain interest. The variety, in order to be most profitable has to include different kinds of techniques as well as different levels of activity (tug-o'-war, volleyball, soccer).

There are some indispensable prerequisites of a profitable physical training program for neuropsychiatric patients:

- (1) That everyone participate in something.
- (2) That performance and not proficiency be stressed.
- (3) That the minimum kinesthetic skills required be within the capacity of the least proficient.
- (4) That it be conducted within a framework of order and discipline.
- (5) That, wherever possible, it stress group activity and not individual performance.
- (6) That the competing groups be evenly matched with equal chances for success.
- (7) That the competitive spirit incited be keen, but controlled.

For all practical purposes there are three broad groups of neuropsychiatric patients which will come within the scope of the physical training program:

- (1) Neurologic patients - those with organic disease of the nervous system (open ward patients).
- (2) Psychotic patients - those with frank mental illness (locked

ward patients).

(3) Psychoneurotic patients - those with emotional and adjustment problems with or without functional physical symptoms (usually open ward patients).

In the interest of an efficient program the activities of the groups should be separate and distinct. In all instances the ward medical officer should be consulted regarding each patient's physical condition and physiologic capacity, the duration and kind of physical activity planned, the degree of supervision and control indicated and the kind of equipment which will be used. Physical training for neurologic and psychotic patients should be prescribed specifically for each patient.

PART II. PROGRAM CONTENT AND METHODS
EXERCISES FOR GROUP FOUR

The series of seven exercises given below is to be performed twice. The exercises selected cover the whole body. When given twice a limited number of repetitions of each exercise, reasonably good condition can be maintained without overtaxing the patient's strength. The "Lung Conditioner" is given after the series has been completed twice.

Obviously all patients will not be able, because of specific surgical or other disabilities, to perform all the exercises. The selection by the ward medical officer of suitable alternative exercises makes it possible for all patients to participate throughout the exercise period.

Wherever the situation requires, group 4 patients can be subdivided further and a red exercise card used to indicate fewer repetitions of each exercise, an orange one for moderate dosage and a green card for full work.

I. WAKER-UPPER



PURPOSE: To develop extensor muscles of cervical and dorsal spine.

POSITION: Lying on back with elbows bent, fists clenched at sides of shoulders. Look at head of bed.

ACTION:

1. Press elbows and head down against mattress.
2. Press harder.
3. Press still harder.
4. Relax.

Note: Breathe freely throughout the exercise. Those with shoulder conditions should keep hands at sides or use the ALTERNATE LEG-RAISER (I-A)



I-A. ALTERNATE LEG-RAISER



PURPOSE: To strengthen hip flexor and abdominal muscles.

POSITION: On back, arms at sides, palms down.

ACTION:

1. Raise left leg upward to the vertical.
2. Lower left leg and at the same time raise right leg to the vertical.
- 3-4. Repeat. On last repetition finish with both legs on bed.



II. MATCHING SOLES



PURPOSE: To strengthen muscles of the feet and lower legs.

POSITION: Lying on back, fingers laced behind head, knees bent and separated, soles of feet together.

ACTION: 1. Stretch legs downward, pressing soles of feet together as much as possible and dorsi-flexing the feet as the legs are extended.
 2. Bend knees, bringing feet upward as close to hips as possible, pressing the soles of the feet together hard.

3-4. Repeat.

Note: The principal muscles used in this exercise are practically all the muscles of the legs and feet. If the heels touch only lightly against the sheet, the abdominal and thigh-flexer muscles are exercised somewhat. If, however, the patient has had a recent abdominal operation and wishes to spare those muscles, he should rest the heels firmly against the bed so that they slide up and down on the sheet.

For knee conditions keep knees straight and dorsi- and plantar-flex the feet, keeping inner borders of soles as closely together as possible throughout.

III. BRIDGE



PURPOSE: To develop back extensors, gluteals and hamstrings.

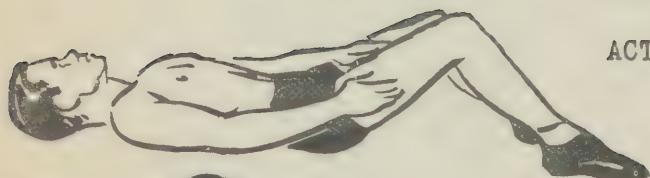
POSITION: On back, knees drawn up, feet about two feet apart, elbows flexed, fists pressed against bed at sides of head.

ACTION:

1. Lift body from bed with weight resting on head, fists and feet.
2. Relax to original position.
- 3-4. Repeat.

Note: Breathe freely throughout the exercise.

IV. CRISS-CROSS CURL



PURPOSE: To strengthen abdominal and lateral trunk muscles.

POSITION: Supine, knees bent, feet 12" apart.

ACTION:

1. Sit up, sliding right hand along inside of left thigh toward left patella. Left hand is on outside of left thigh, sliding toward left patella. Exhale. Continue until both hands reach knee-cap.
2. Return to starting position.
3. Repeat action 1 with left hand on inside of right thigh, right hand on outside.
4. Return to starting position.

Note: For post-abdominal cases use LEG-STRETCHER (IV-A).

IV-A. LEG-STRETCHER



V. CHEST-LIFTER



PURPOSE: To maintain tone of quadriceps extensors.

POSITION: On back with pillow doubled under knees.

ACTION:

1. Point toes down hard, straightening knees forcibly.
2. Recover to starting point.
3. Pull toes up hard, straightening knees forcibly.
4. Recover to starting position.

PURPOSE: To strengthen upper cervical and dorsal extensor muscles.

POSITION: On back, forearms folded on top of head.

ACTION:

1. Press shoulders and head against bed, arching upper thoracic and cervical region, raising chest toward head of bed. Keep hips in contact with bed.
2. Relax to starting position.
- 3-4. Repeat.

Note: For shoulder conditions, keep hands at sides.

VI. HIP-ROLL



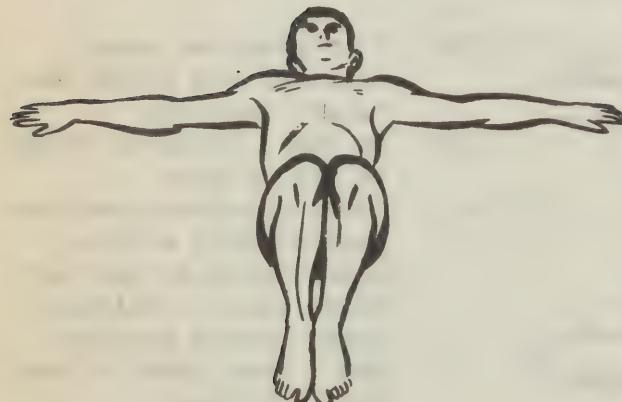
PURPOSE: To strengthen oblique abdominal muscles.

POSITION: On back with arms at side shoulder level, palms down.

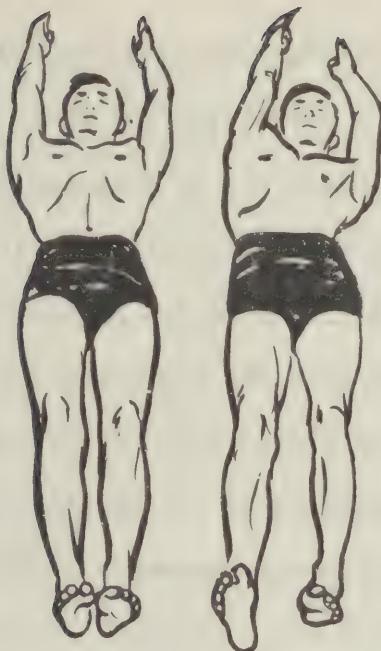
ACTION:

1. Raise the knees upward so that thigh is at a 90° angle with the body.
2. Lower knees together to bed at the side of right hip.
3. Return to position one.
4. Return to starting position. Repeat, lowering legs to side of left hip.

Note: For abdominal cases use LEG-STRETCHER (IV-A).



VII. LAZY BONES



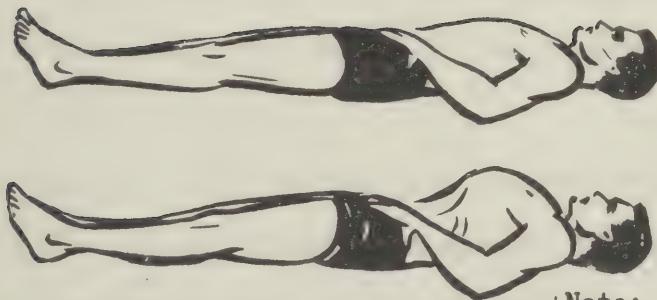
PURPOSE: To strengthen extensors.
 POSITION: On back with arms through head of bed, in line with bdy.

ACTION:

1. Reach right arm upward as far as possible, and reach down as far as possible with the right heel.
2. Relax to starting position.
3. Repeat with left arm and heel.
4. Relax to starting position.

Note: For shoulder and abdominal cases, keep hands at sides, and simply stretch the legs.

LUNG-CONDITIONER



PURPOSE: To ventilate the lungs, to combat atelectasis.
 POSITION: Lying on back, hands on hips.

ACTION:

1. Inhale on four counts, taking a deeper breath on each count.
2. Exhale on four counts, attempting on last count to blow out "all" of the air and, at the same time, to tighten buttocks
- 3-4. Repeat.

Note: This breathing exercise should follow the second repetition of the preceding seven exercises.

EXERCISES FOR GROUP THREE

A set of exercises designed to maintain physical condition without aggravating the affected part has been formulated for group 3 patients. These exercises will aid in preparing the patient for the more vigorous conditioning activities in which he will participate in groups 2 and 1. The ward medical officer will indicate on the patient's exercise card any exercises which, in his opinion, may aggravate the condition of the affected part. Alternate exercises will be prescribed by the ward medical officer with the assistance of the physical training officer to take the place of the contraindicated movements. Alternate exercises are listed under the parts of the body affected. Following the weekly reclassification, exercises may be changed at the discretion of the ward medical officer.

Group 3 exercises are given twice daily in periods of approximately thirty minutes' duration. New patients in this group may be given fewer repetitions of exercises, while those who are about to be graduated to group 2 will usually spend the full thirty minutes exercising. Special emphasis should be given to correct body mechanics and to foot exercises.

In addition to the thirty-minute calisthenics drill the physical training program for group 3 should provide from thirty minutes to an hour of special remedial exercises and/or sports and games adapted to the individual patient's condition. The remedial exercises are prescribed by the ward medical officer to be performed under the supervision of the physical training instructor.

I. HIGH STEPPER



PURPOSE: To provide a general warm-up.

POSITION: Standing.

ACTION: 1. With moderately high knee action and with arms relaxed, mark time.
2. Double time.
3. Quick time.
4. Mark time.

Note: On second repetition increase amount of double time.

II. THE ARCHER



PURPOSE:

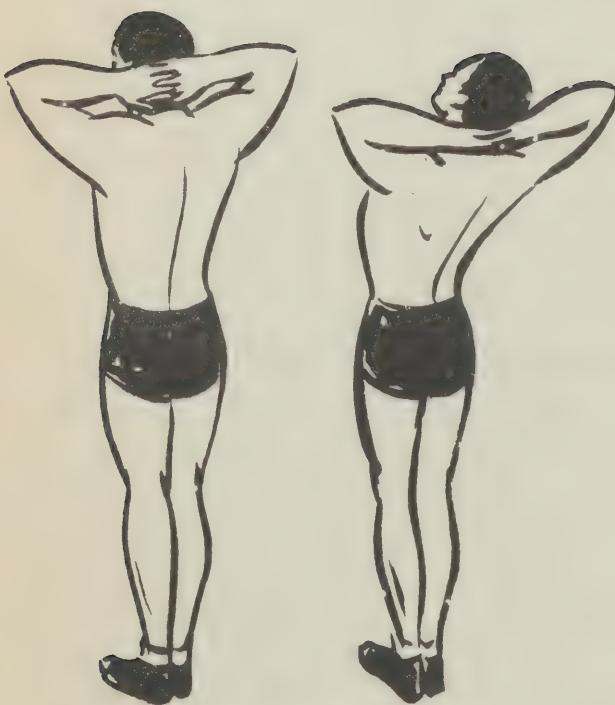
To develop the latissimus dorsi, shoulder retractors, erector spinae and gluteus maximus.

POSITION:

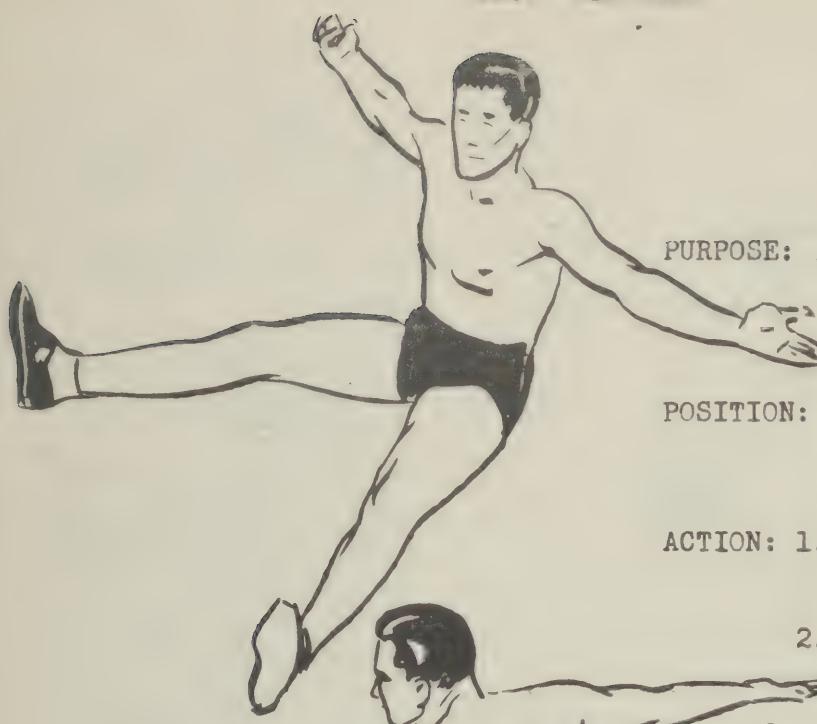
Lying prone, hands clasped back of head, feet together and on deck.

ACTION: 1. Raise chest, head and arms from the deck.
2. Return to original position.
3-4. Repeat.

Note: May be done standing as an arching movement if deck is wet.



III. WINDMILL



PURPOSE: To develop chest, shoulders, back and oblique abdominals, and to stretch the hamstrings.

POSITION: Sitting with legs astride and arms at side shoulder level, palms up.

ACTION: 1. Twist body to right, and touch toes of right foot with left hand.
2. Twist body to left, and touch toes of left foot with right hand.
3-4. Repeat.

Note: May be done standing, with feet about two feet apart. Keep legs straight throughout the exercise. In back cases limit twist.

III-A. WASHERWOMAN



PURPOSE: To stretch hamstrings and develop back extensors.

POSITION: Standing, with arms overhead at shoulder-width.

ACTION: 1. Bend trunk forward, swinging arms downward to touch thighs with hands.
2. Bend downward, touching hands to shins.
3. Bend downward, touching fingers to deck.
4. Return to starting position, swinging the arms forward and upward.

Note: The legs are kept straight throughout the exercise.

Actions 1, 2, and 3 are accomplished by a "bobbing" movement.



IV. BREAKING CHAINS



PURPOSE: To strengthen shoulder retractors and upper erector spinae muscles.

POSITION: Standing with elbows raised at side shoulder level, hands in front of chest as if grasping a chain.

ACTION:

1. Contract adductors of scapulae and slowly pull fists to position directly in front of shoulders as though breaking a chain.
2. Relax tension slightly, and then pull a little more than in Count 1.
3. Relax tension, and pull still more.
4. Recover to starting position.

Note: In a shoulder condition, keep affected arm and hand at side.

V. SIDE-BENDER



PURPOSE: To develop oblique abdominals, quadratus lumborum, extensors of spine and hip abductors.

POSITION: Side-straddle standing, fingers laced behind head, chest up.

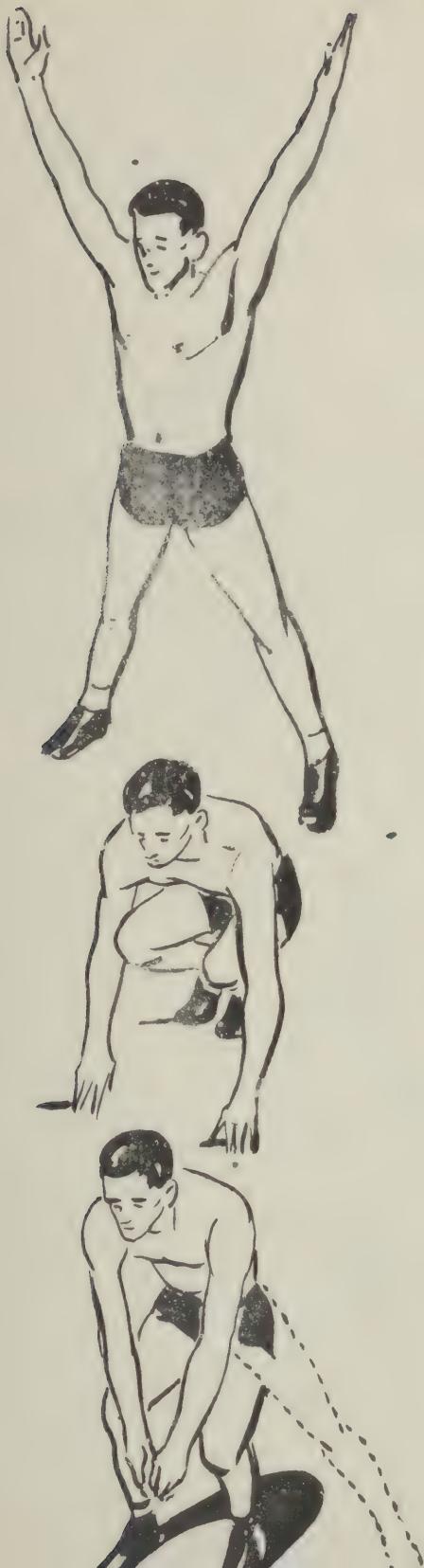
ACTION:

1. Bend to left.
2. Recover.
3. Bend to right.
4. Recover.

Note: For shoulder conditions, keep hands on hips.



VI. JUMPING JACK



PURPOSE: To provide a vigorous endurance exercise with special emphasis on extensors of legs, back and arms.

POSITION: Side-straddle standing with arms above head.

ACTION: 1. Jump to a squat with feet together and hands on deck in front of feet.
2. Return to original position.
3-4. Repeat.

Note: For back cases, jump to a half-squat with hands between knees.

For knee or hip cases, extend affected leg to the rear or to the side in the jump.

VII. LEG-LIFTER

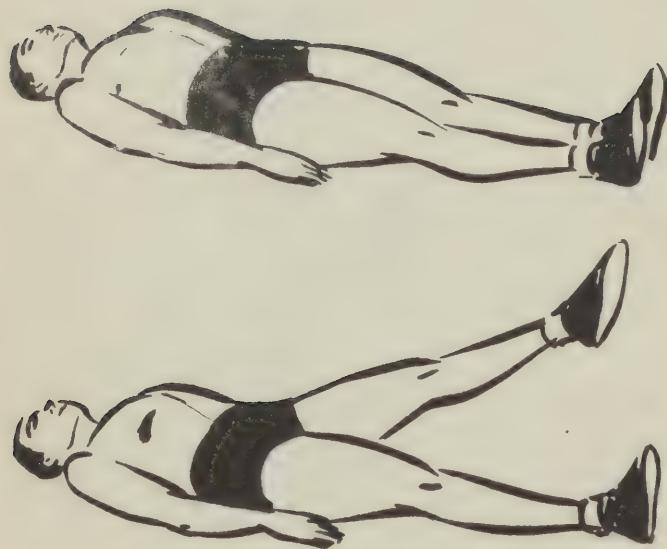
PURPOSE: To develop thigh flexors and (secondarily) the abdominal muscles.

POSITION: Supine on deck, arms at sides and legs straight.

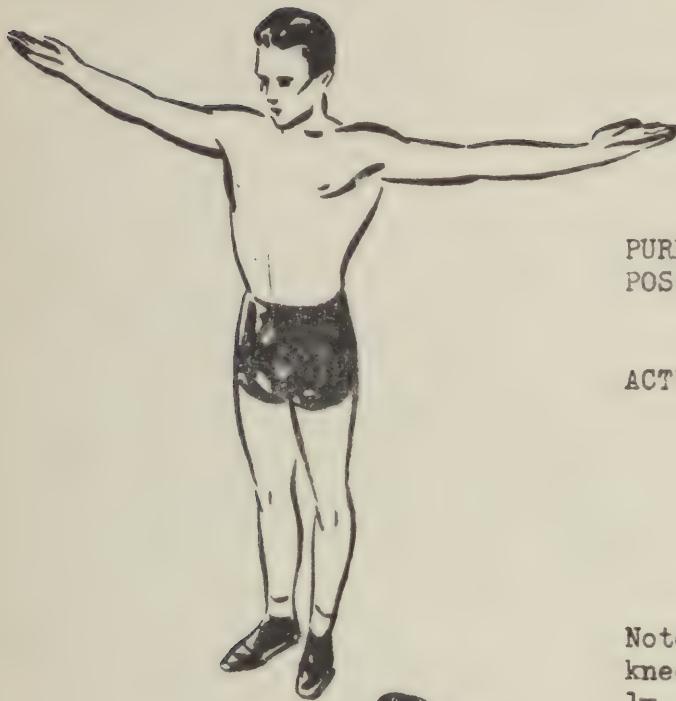
ACTION:

1. Raise left leg to a 45° angle.
2. Lower left leg, and at the same time raise right leg to a 45° angle.
- 3-4. Repeat.

Note: As an alternative, substitute FRONT KICK.



VII-A. FRONT KICK



PURPOSE: To develop thigh flexors.

POSITION: Standing with arms at side shoulder level, palms up.

ACTION:

1. Slowly raise left leg forward, swinging arms forward to front shoulder level.
2. Return to original position.
- 3-4. Repeat with right leg.

Note: For back cases, bend the knee of the supporting leg slightly.



LUNG-CONDITIONER



PURPOSE: To ventilate the lungs and to overcome atelectasis.

POSITION: Standing with hands on hips.

ACTION: 1. Inhale by four distinct elevations of the chest, taking more air with each successive inhalation.
 2. Exhale by four distinct "waves," attempting to blow all the air out.
 3-4. Repeat.

Note: This breathing exercise should follow the second repetition of the preceding seven exercises.

The following games and sports are suggested for group 3:

- Archery
- Bait and fly-casting
- Badminton
- Bag-punching
- Bowling
- Box hockey
- Deck tennis
- Hiking
- Horseshoe pitching
- Playing catch
- Relays
- Rope-skipping and rope-spinning
- Shooting baskets
- Shuffleboard
- Swimming
- Table tennis
- Volleyball

EXERCISES FOR GROUP TWO

These exercises are for the purpose of conditioning group 2 convalescents for the more vigorous activities offered to group 1. Emphasis is placed on the development of strength and endurance, but due care must be exercised not to aggravate the individual's original disability. Medical cases must be guarded against cardio-respiratory and other organic strain. Two hourly periods or one two-hour period scheduled daily for group 2 patients is considered appropriate for supervised physical training in addition to scheduled work details.

The physical training program for group 2 consists of:

- Conditioning drill (see page II-21) and guerrilla and grass drills
- Remedial exercises as needed
- Running
- Gymnastic stunts
- Sports, games and relays
- Combatives
- Aquatics

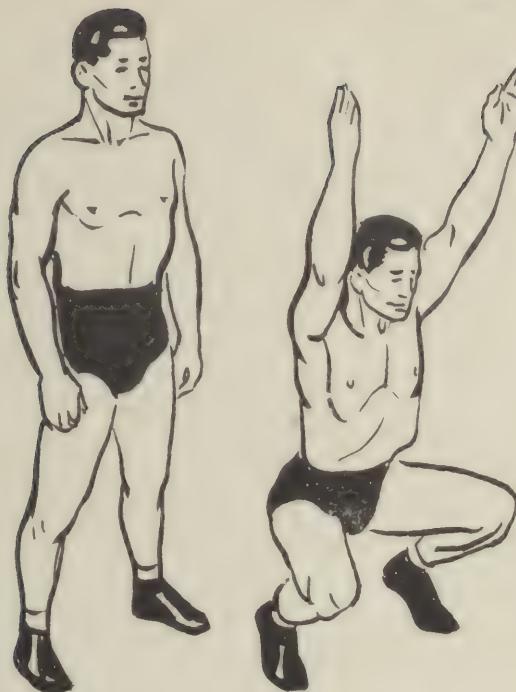
The following games and sports are suggested for group 2:

- Badminton
- Bicycle-riding
- Deck tennis
- Dodge ball
- Fishing
- Handball
- Horseshoe pitching
- Medicine ball throwing
- Playing catch
- Rope-skipping
- Tennis
- Volleyball

Although the objective of the physical training program for group 2 convalescents is largely conditioning, attention should be given to teaching skills in games and sports in order that the convalescent may experience success in these activities.

In addition to the physiological benefits to be derived from physical training activities, special emphasis should be placed on the socializing values through cooperative group activity. Important psychological benefits, through emotional satisfactions, may be secured from successful performance and from the knowledge that one is contributing to the success of the group.

I. SQUAT-STRETCH



PURPOSE: To provide a hygienic warm-up.

POSITION: Standing, feet about 18" apart.

ACTION:

1. Swing arms sideward and upward, bending knees to a half-squat.
2. Return to starting position.
- 3-4. Repeat.

Note: For shoulder conditions keep hand of affected side on hip.

II. THE DIPPER



PURPOSE: To develop triceps and anterior deltoid.

POSITION: Front leaning rest, hands on deck directly beneath shoulders.

ACTION:

1. Flex arms, touching deck with chest only.
2. Straighten arms, returning to front leaning rest.
- 3-4. Repeat.

Note: When in the front leaning rest position, shoulder blades should be drawn together, buttocks held tight and abdomen drawn in.

For arm conditions, use
PUSH-DOWNS (II-A).

II-A. PUSH-DOWNS



PURPOSE: To strengthen shoulder retractors, external rotators and the extensors of the arms.

POSITION: Standing, trunk bent forward 30° , arms turned outward strongly, palms facing deck, elbows straight.

ACTION: 1. Push downward slowly and as hard as possible with heels of the hands.
2. Relax.
3-4. Repeat.

III. CURL



PURPOSE: To develop the abdominal muscles.

POSITION: Supine, knees flexed at 45° angle, feet flat on deck, hands on thighs.

ACTION: 1. Raise head, shoulders and trunk off deck until the hands touch the knee caps.
2. Return to starting position.
3-4. Repeat.



Note: When deck is wet, use WASHERWOMAN (page II-12).

For back and hip conditions, use PUNTER (III-B).

III-B. PUNTER



PURPOSE: To strengthen hip flexors.

POSITION: Standing, arms at side shoulder level.

ACTION:

1. Kick forward and upward with right foot. At the same time swing arms forward to front shoulder level. Accompany this action with a slight bend of the left knee.
2. Return to starting position.
3. Repeat action 1, using left foot as the kicker and bending right knee.
4. Return to starting position.

Note: For back cases, modify kick to a "drop-kick" leg action.

IV. ABDOMINAL ARCH



PURPOSE: To develop the extensors of the back and legs.

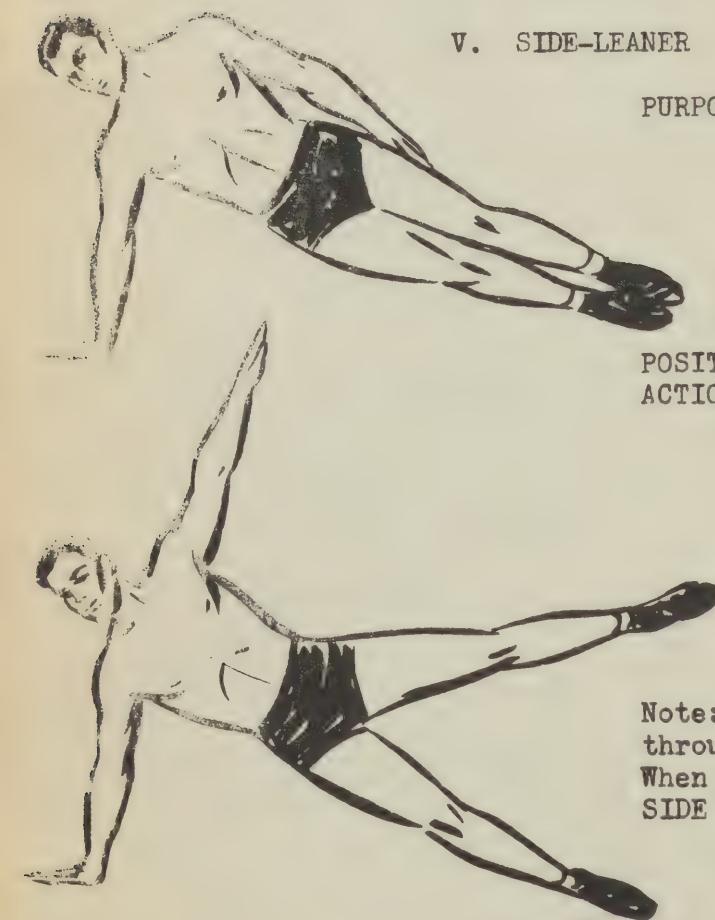
POSITION: Prone with hands clasped behind neck.

ACTION:

1. Raise both chest and legs off deck, attaining an arch or "rocker" position.
2. Relax to starting position.
- 3-4. Repeat.

Note: Keep knees straight throughout exercise.

V. SIDE-LEANER



PURPOSE: To strengthen triceps, abductors of hip, serratus magnus, quadratus lumborum and latissimus dorsi of supporting side. (This exercise is also a good test of general endurance.)

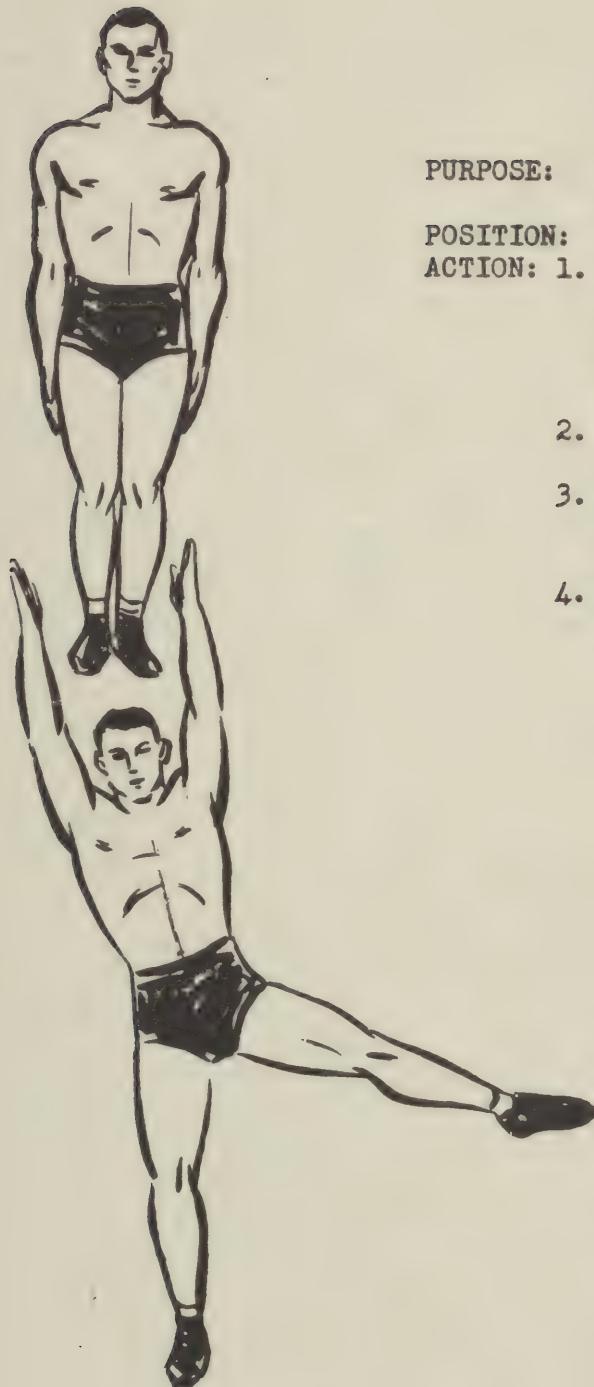
POSITION: Side-leaning rest.

ACTION:

1. Supported by right arm and right leg, lift left arm and left leg together.
2. Lower left arm and leg to starting position.
- 3-4. Repeat. Then turn and repeat, supported by left arm and leg.

Note: Change sides by moving through back-leaning-rest position. When deck is wet, use STANDING SIDE LEG-RAISER (V-A).

V-A. STANDING SIDE LEG-RAISER



PURPOSE: To develop hip abductors.

POSITION: Attention.

ACTION:

1. Lift arms sideward and upward, at the same time lifting left leg sideward and bending the right knee slightly.
2. Return to starting position.
3. Repeat, lifting right leg and bending left knee.
4. Return to starting position.

VI. LEG-THRUSTER



PURPOSE: To develop muscles of leg and thigh.

POSITION: Squatting with hands on deck.

ACTION:

1. Extend both legs to rear, keeping trunk and legs in a straight line, head up.
2. Return to starting position.
- 3-4. Repeat.

VII. 440



PURPOSE: To improve cardio-respiratory endurance.

POSITION: Attention.

ACTION:

1. Marching in place to military quick-time cadence, knees raised high, arms pumping vigorously.
2. Double-time march in place, increasing speed.
3. Return to quick time.
4. Return to starting position.

EXERCISES FOR GROUP ONE

A program of safe, progressive physical training has been designed to condition group 1 convalescents in order that they may return to duty capable of carrying on the activities of their group. Emphasis is placed upon the development of strength, endurance, agility and coordination with care being exercised not to aggravate the patient's original defect or disability. In addition to the scheduled work details this group will need three hours of supervised physical training to develop their total fitness for full duty.

The physical training program for group 1 consists of:

- Calisthenics
- Guerrilla and grass drills
- Running
- Gymnastic stunts
- Games and sports
- Combatives
- Aquatics

Approximately fifteen minutes should be devoted to calisthenics for group 1 convalescents.

Guerrilla and grass drills should be limited to a period of not more than five minutes.

Running should be given for approximately ten minutes. Good military form should be practiced in moving groups on the double from one activity to another.

Gymnastic stunts can be given for approximately one hour with the class broken up into smaller groups. Groups move from one activity

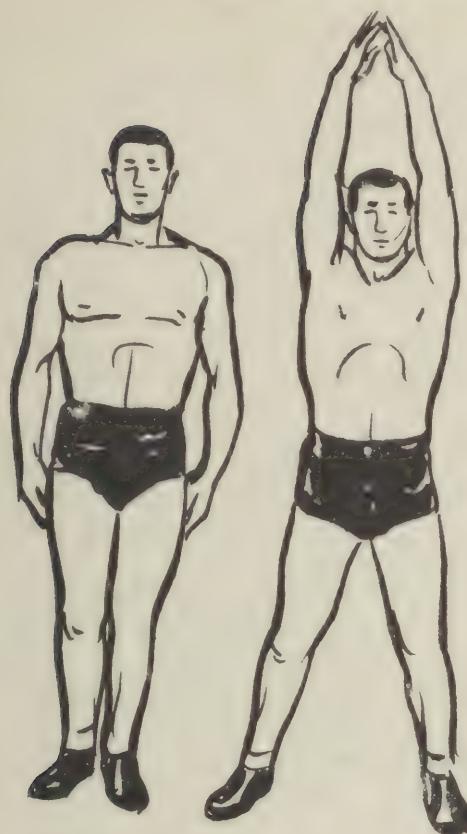
to another at ten- or fifteen-minute intervals. Suggested activities are:

- Rope-skipping
- Rope-climbing
- Medicine-ball throwing
- Bag-punching
- Indian club-swinging
- Games and sports
- Hand-to-hand combatives
- Fundamentals of tumbling
- Barbell exercises (see page II-36)
- Exercises on rowing machine
 - stallbars
 - apparatus (where available)
 - horizontal bar
 - horizontal ladder
 - rings
 - horse
 - buck

The following games and sports are suggested for group 1 con-
valescents:

- Basketball
- Field hockey
- Skating and ice hockey
- Group games of low organization
- Soccer
- Softball
- Speedball
- Touch football
- Track and field sports

I. SIDE-STRADDLE HOP (Jumping Jack)



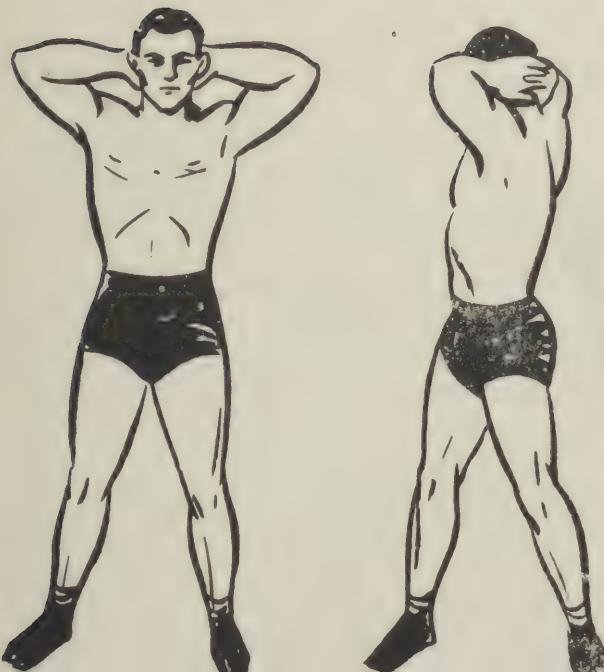
PURPOSE: To provide a general warm-up.

POSITION: Attention.

ACTION:

1. Raise arms sideward upward, touching hands above head (arms straight), and at the same time jump to position with feet apart sideward.
2. Return to original position.
- 3-4. Repeat.

II. FOUR-COUNT TWISTER



PURPOSE: To develop rotators of spine and abdominal obliques.

POSITION: Standing with feet about 18" apart, hands clasped behind neck.

ACTION:

1. Twist trunk to right.
2. Return to starting position.
3. Twist trunk to left.
4. Return to starting position.

Note: Keep legs straight throughout exercise.

III. BEND AND SQUAT



PURPOSE: For development of hamstrings, flexors of hip and lower leg, and quadriceps.

POSITION: Standing, hands on hips.

ACTION:

1. Keeping knees straight, bend trunk forward as far as possible, touching fingers (or palms if possible) to the deck.
2. Return to starting position.
3. Execute full knee bend extending arms forward and parallel with deck, keeping back straight, weight on toes.
4. Return to starting position.

IV. TREADMILL



PURPOSE: To develop flexors and extensors of hip and lower leg.

POSITION: Forward leaning rest with right knee flexed under chest.

ACTION: 1. Thrust right leg backward to full extension at the same time advancing left knee to a flexed position under chest.

2. Reverse.

3-4. Repeat.



V. SNAP AND TWIST



PURPOSE: To develop the abdominals and the flexors of thigh.

POSITION: On back with arms extended overhead and in line with body.



ACTION: 1. With a "snap and twist" action raise the body and bend left knee, extending right arm forward and left elbow backward. (This should be an "explosive" type of motion.)

2. Return to original position.

3-4. Repeat to opposite side.

VI. BOB AND RELAX

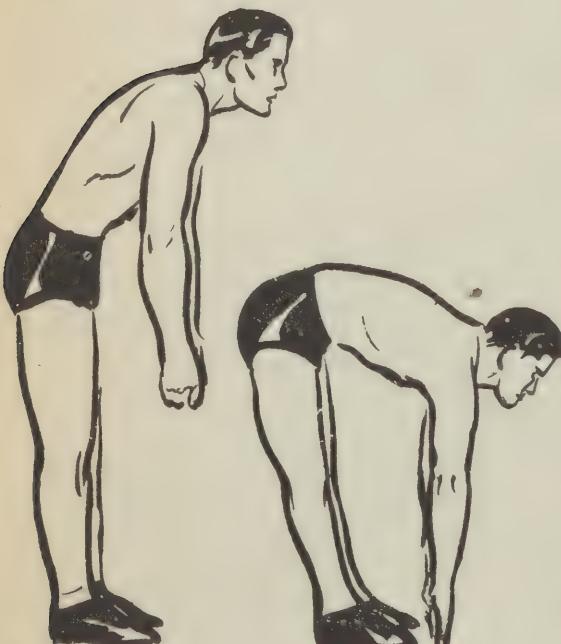


PURPOSE: To develop extensors of trunk.

POSITION: Attention.

ACTION:

1. Keeping knees straight, relax trunk forward and downward, touching fingers to ankles.
2. Immediately "bounce" or "bob" part way back toward the erect position.
3. Relax forward and downward, going further downward.
4. Return to erect position.



VII. ABDOMINAL TWISTER



PURPOSE: To develop abdominal muscles.

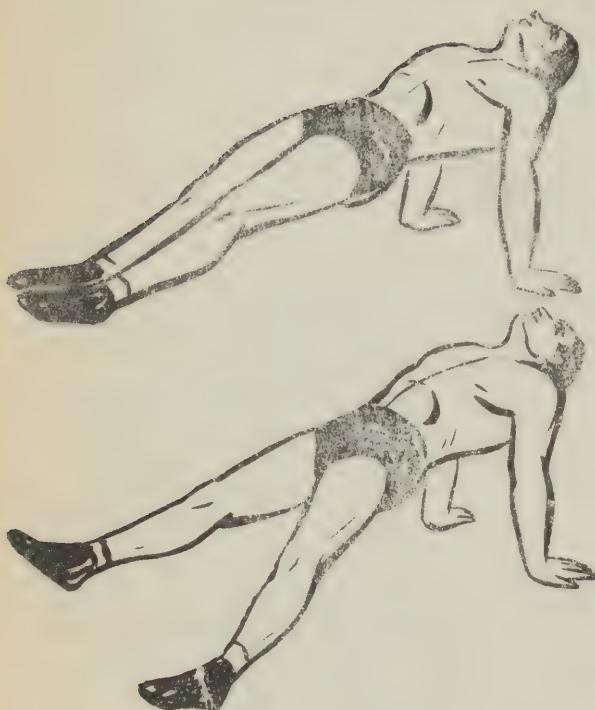
POSITION: Supine with arms extended at side shoulder level, palms up.

ACTION:

1. Raise both legs (with knees straight) to a position in which the legs are at a right angle with the body.
2. Keeping both knees straight and heels extended, lower both feet toward right hand.
3. Draw abdomen well in and slowly raise legs to right angle with the body.
4. Return both legs to starting position but with heels off deck.

Note: Second repetition of this movement will be done to the left side, third to right side, etc.

VIII. THE "V" SPREAD.



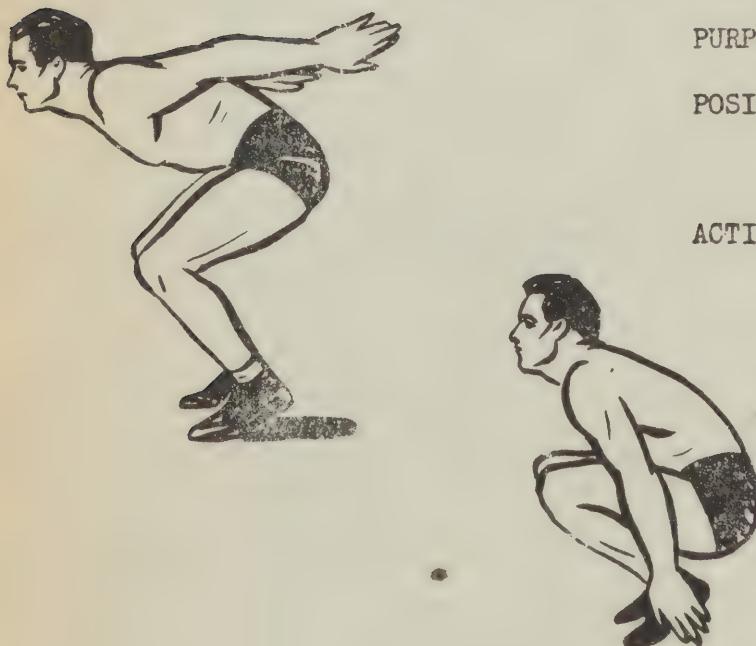
PURPOSE: To develop hip adductors, abductors and extensors.

POSITION: Back leaning rest.

- ACTION:** 1. Spring to a leg spread, forming a "V" with the lower extremities.
2. Return both legs to original position.
- 3-4. Repeat.

Note: Keep abdomen in and chest up throughout exercise. Do not allow body to sag.

IX. JUMP AND TOUCH



PURPOSE: To increase general endurance.

POSITION: Half crouch, as though about to begin a standing broad jump, arms backward.

- ACTION:** 1. Swing arms forward and spring straight upward, taking a "tuck" position with knees to chest, heels to buttocks, swinging arms downward outside of feet.
2. Return to original position.
- 3-4. Repeat.

X. 440



PURPOSE: To improve cardio-respiratory endurance and to provide a "finishing off" exercise preparatory to games and sports.

POSITION: Attention.

ACTION:

1. Marching in place to military quick-time cadence, knees raised high, arms pumping vigorously.
2. Double-time march in place, speeding up the cadence.
3. Return to quick time.
4. Return to starting position.

BARBELL EXERCISES

Purpose

To develop muscular strength. The addition of the barbell insures a more rapid development by increasing the load.

Gear

Fixed-weight barbells are preferable, for they may then be used without delay in adjustment. They may be made by casting concrete on the ends of pipe or using wash or broom handles with large cans filled with cement on the ends. The weight of the barbells should vary, if possible. Twenty-eight to forty pounds is a good weight for convalescents.

Methods

For best results, barbell exercises should not be given on successive days.

They should always be preceded by a few warm-up exercises.

Arm-swinging and other stretching exercises should be given occasionally between the barbell exercises.

The exercise should be given until the individual's muscles fatigue rather than a prearranged number of times.

The hands should be placed on the barbells shoulder-width or a little wider. Unless otherwise specified the barbells should be held with the overgrasp (palms backward, when weight is held in front of thigh).

Movements should be performed smoothly, not too quickly.

Breathe freely during all exercises.

I. MILITARY PRESS



PURPOSE: To strengthen the triceps and the shoulder muscles.

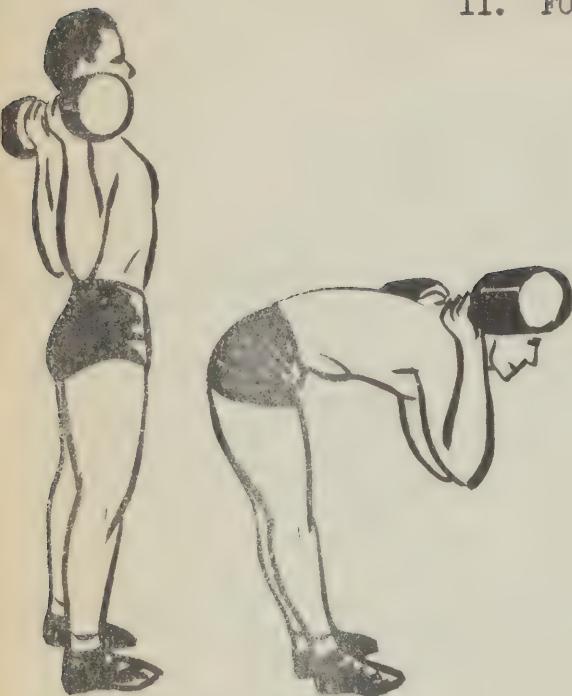
POSITION: Barbell at chest, palms forward.

ACTION: 1. Extend arms overhead.
2. Return to the starting position.
3-4. Repeat.

Note: Look up throughout the movement. Keep the body erect. Do not sway back at the waist.



II. FORWARD BEND



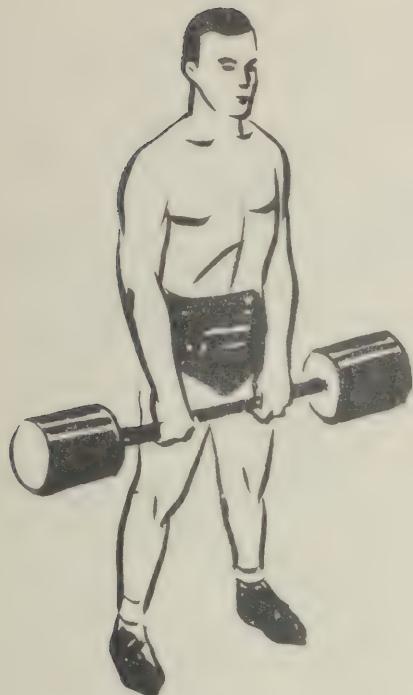
PURPOSE: To develop the muscles of the back.

POSITION: Barbell behind neck.

ACTION:

1. Bend forward as far as possible, keeping back straight and knees stiff.
2. Return to starting position.
- 3-4. Repeat.

III. TWO-ARM CURL

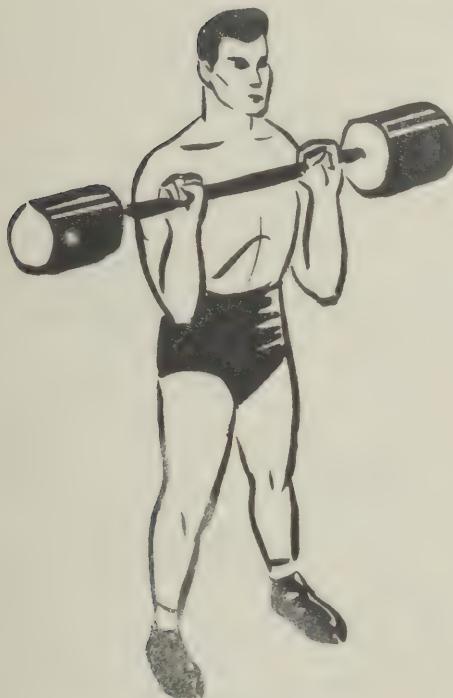


PURPOSE: To develop the flexors of the elbow.

POSITION: Barbell resting against thighs.

ACTION: 1. Raise barbell to chest, keeping elbows at sides.
2. Return to starting position.
3-4. Repeat.

Note: Do not allow trunk to sway.



IV. ABDOMINAL CURL



PURPOSE: Abdominal strengthening.

POSITION: Lie on back with knees up, feet flat on deck, hands on thighs, barbell on feet holding them down.

ACTION: 1. Raise trunk until you can touch knee-caps with palms of hands.
2. Return to starting position.
3-4. Repeat.

V. FORWARD SWEEP



PURPOSE: To develop the muscles of the shoulders and back.

POSITION: Barbell resting against thighs.

ACTION: 1. Raise arms forward upward, keeping the elbows extended. Keep the body from swaying.

2. Return to starting position the same way.

3-4. Repeat.

VI. SIDEWARD BEND



PURPOSE: To develop lateral trunk muscles.
POSITION: Barbell on shoulders behind the neck.
ACTION:

1. Bend trunk to left.
2. Return to starting position.
3. Bend to right.
4. Return to starting position.



VII. ROWING EXERCISE



PURPOSE: To strengthen back, shoulder and arm muscles.

POSITION: Hold barbell at chest, palms out. Bend trunk forward until back is parallel to deck.

ACTION: 1. Extend arms toward deck.
2. Bend arms.
3-4. Repeat.

Note: Be sure to keep back flat and parallel to deck.

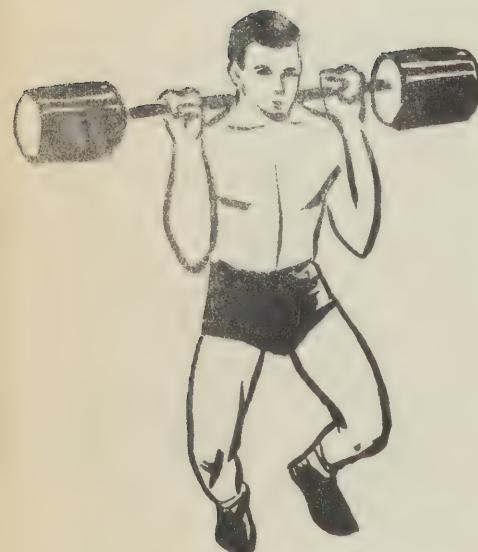
VIII. KNEE-BEND



PURPOSE: To develop extensors of hips and knees.

POSITION: Barbell on shoulders behind neck.

ACTION: 1. Bend knees to half (or full) squat.
2. Return to starting position.
3-4. Repeat.



REMEDIAL EXERCISES

There follow certain "on-the-hour" exercises and activities to be used as alternates when certain exercises in set drills are contraindicated.

These exercises are of two distinct types:

- A. Those which do not directly involve the affected part; e.g., "quadriceps setting" in post-abdominal cases.
- B. Those which do involve the affected part; e.g., "patella setting" in post-semilunar cartilage cases, mild bicycling exercise while patient is supine in bed for post-abdominal cases on a stated post-operative day, or the same exercise for a post-semilunar on a stated post-operative day.

Note: Authority for the use of either type of exercise will be granted only by the ward medical officer.

The usual procedure is to have the ward medical officer select one or two exercises to be performed by the patient at the beginning of each hour while patient is awake or not otherwise engaged in carrying out some other prescribed assignment.

AMPUTATIONS

Important

To be done when the ward medical officer permits.

The number of repetitions for each exercise will be prescribed by the ward medical officer.

Purpose

To prevent or overcome joint contractures.¹

To maintain joint strength and flexibility.

To develop coordination of joints and total body movement.

Lower Limbs

For knee flexion contracture (midleg amputation).

I.



POSITION: Sitting on chair with stump of affected leg hanging over chair.

ACTION: Extend knee against resistance.

Note: Hamstrings must be trained to relax while quadriceps is contracting.

¹Note: Flexion and abduction contractures must be guarded against. See U. S. Naval Medical Bulletin, Vol 43. No. 4, Oct., 1944, page 634.

II.



POSITION: Sitting on decl...
 ACTION: Dorsi- and plantar flexion of unaffected limb to strengthen socket for the double duty it will have to perform.

Lower Limbs

For hip flexor and adductor contractures (with thigh and knee)

III.



POSITION: Lying on back.
 ACTION: Internal rotation of affected leg and of stump.

Note: Be sure pelvis is not tilted obliquely.

IV.

POSITION: Lying on unaffected side, with knee in flexed position, held by hand of affected side.

ACTION: Extend stump.



V.

POSITION: Prone lying, hands above head in line with body.

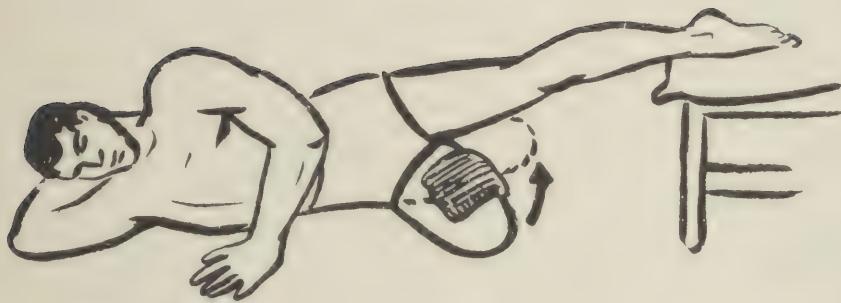
ACTION: Extend and attempt to adduct stump as arm of unaffected side is raised to prevent twisting of body.



VI.

POSITION: Lying on affected side.
 Unaffected leg resting on stool, sand bag resting on medial side of stump.

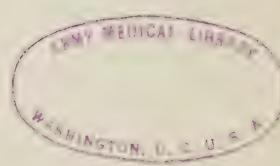
ACTION: Adduct stump against weight.



VII.

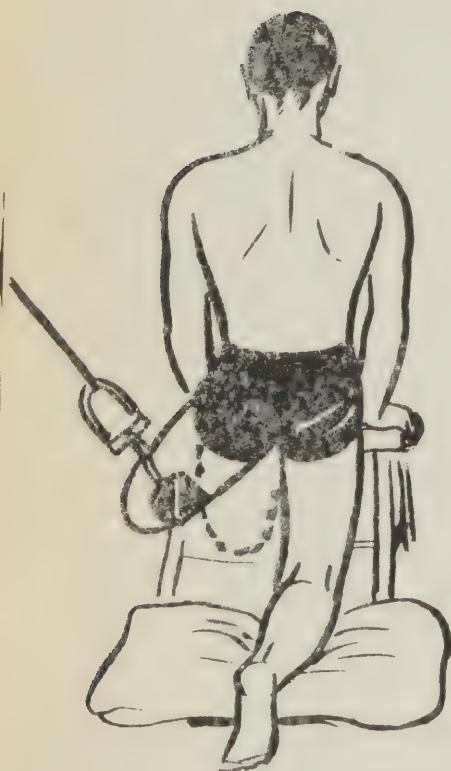
POSITION: Sitting on stool with affected limb extending over side of stool.

ACTION: Extend stump against resistance.



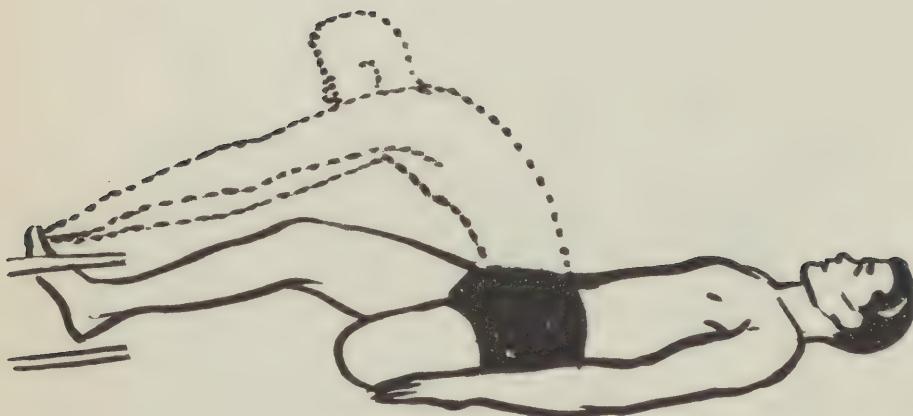
VIII.

POSITION: Kneeling on pillow in front of stool, hands resting on stool.
ACTION: Resistive adduction of stump.



IX.

POSITION: Lying on back with hands at sides, unaffected leg supported at ankle.
ACTION: Sit up and touch toes with hands.



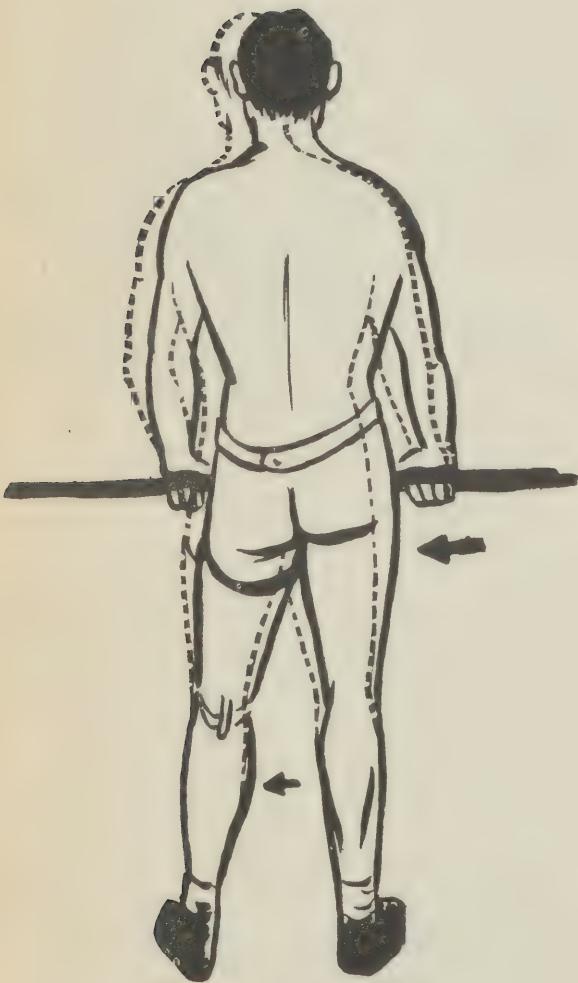
I.



POSITION: Sitting on stool with toes of unaffected foot under outside lower bar of stall bars, elbows bent and hands on shoulders.

ACTION: Lean slightly back and twist trunk, right, front and left.

XI.

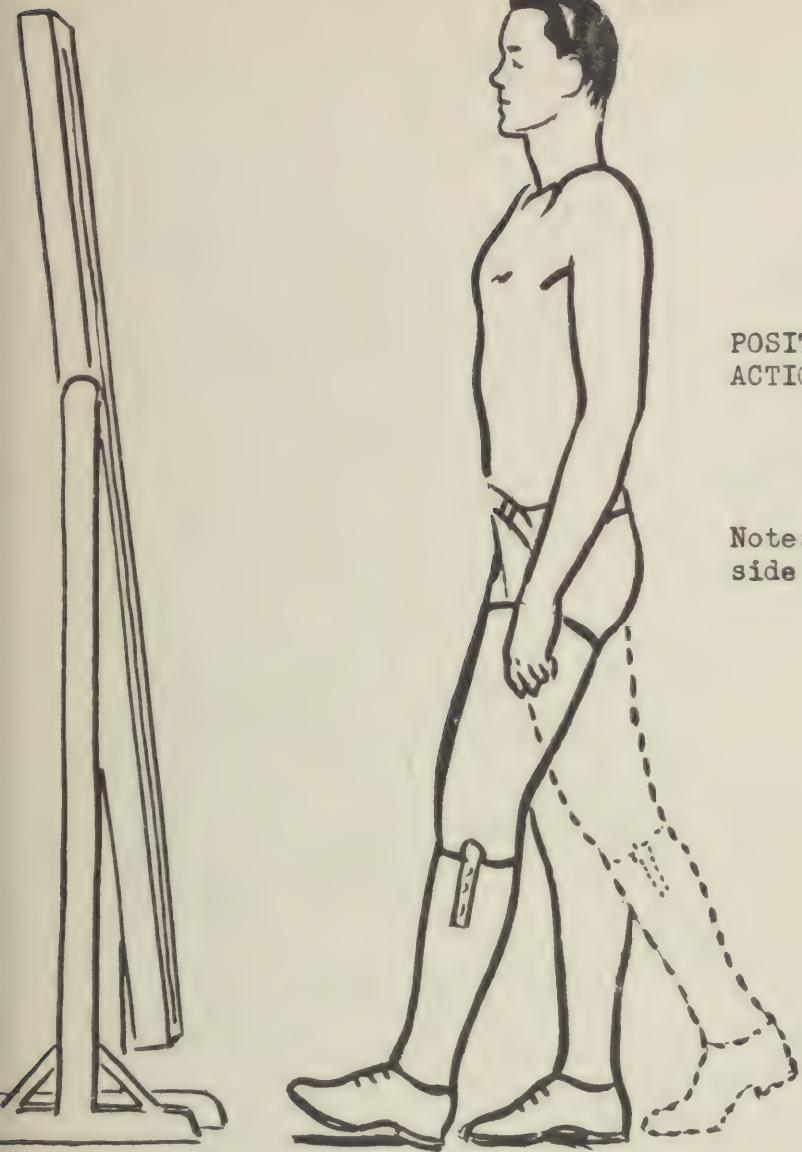


POSITION: Standing with prosthesis.

ACTION: Shifting weight to prosthesis.

Note: Attention must be given to balancing pelvis which frequently is raised on the unaffected side.

XII.



POSITION: Standing before mirror.
 ACTION: (Supervised) Walking
 for proper knee action
 and pendulum motion of
 hips.

Note: Sideward swinging of affected side must be avoided.

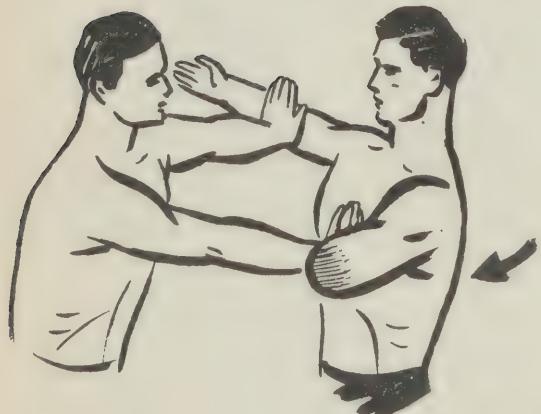
Note: In preparation for crutch-walking emphasis should be given to the development of strong arm-extensor muscles, shoulder adductor muscles and hand-gripping muscles.

As soon as the use of the prosthesis has been learned, activities such as slow tempo social dancing should be stressed.

Upper Limbs

For shoulder muscles (midarm amputations).

XIII.



POSITION: Standing with arm and stump at side shoulder level.

ACTION: Extend arm and stump to front shoulder level against resistance.

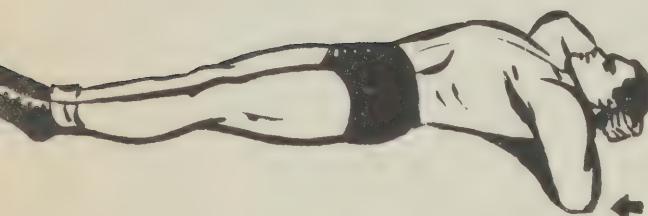
XIV.



POSITION: Standing with arm and stump at side.

ACTION: Against resistance raise arm and stump sideward upward to position over head.

XV.



POSITION: Lying on back with unaffected hand behind neck and stump at side shoulder level.

ACTION: Contract trapezius and rhomboids and arch upper back.

ANKLE AND FOOT DISABILITIES

(Potts' fracture, sprains, flat feet, etc.)

Purpose

Overcome muscle weakness.

Strengthen normal function.



I.

POSITION: Sitting on bed or deck.
ACTION: With knees straight
flex feet toward body
(dorsi-flexion) and
away from body
(plantar flexion).

II.



POSITION: Sitting on bed or deck with feet slightly dorsiflexed.
ACTION: Invert feet, relax and repeat.

III.



POSITION: Sitting on chair.
ACTION: Circumduct feet.

Note: Movement should be invert, plantar-flex and dorsi-flex.

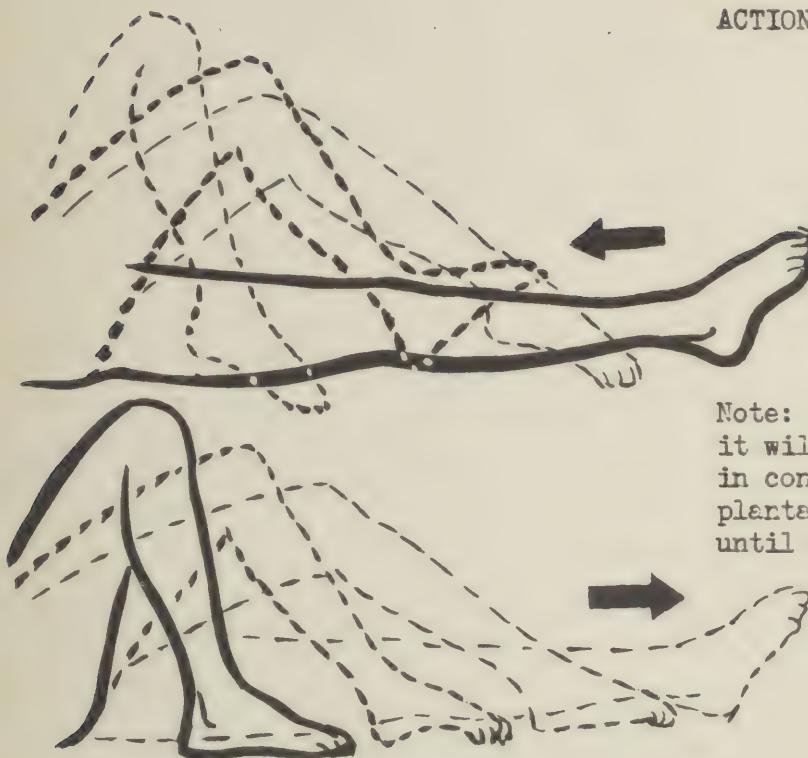


IV.

POSITION: Lying or sitting with knees straight.

ACTION:

1. Slowly dorsi- and plantar-flex feet (toes are held in plantar-flexion throughout the movement) while sliding heels on the deck toward the buttocks.
2. Pause. By a plantar-flexion of the toes, creep feet to their original position.



Note: As knees begin to straighten it will be impossible to keep toes in contact with deck, but continue plantar-flexion movement of toes until knees are fully extended.

V.

POSITION: Lying supine with hands at neck firm position.

ACTION: Alternate leg-raising with knee straight, foot dorsiflexed, inverted, and toes held in plantar-flexion (curled away from body).



Note: Heels should be kept off bed or deck if possible. This exercise can be made more difficult by resting ankle of unaffected leg upon ankle of affected leg and giving slight resistance to the raising of the affected leg.

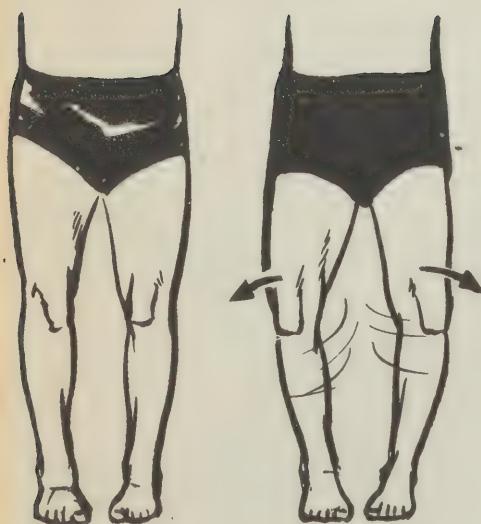
VI.

POSITION: Half-sitting position with hands resting lightly on abdomen.
ACTION: Flex and extend alternate knees, keeping heels off deck throughout and feet dorsiflexed and inverted.



VII.

POSITION: Standing.
ACTION: Keeping knees extended, rotate thighs and lower legs outward while toes are kept in plantar-flexion.



Note: This exercise produces a vigorous action of the tibialis posterior muscle as the patient "lifts himself with his boot straps."

VIII.

POSITION: Standing with feet slightly inverted.

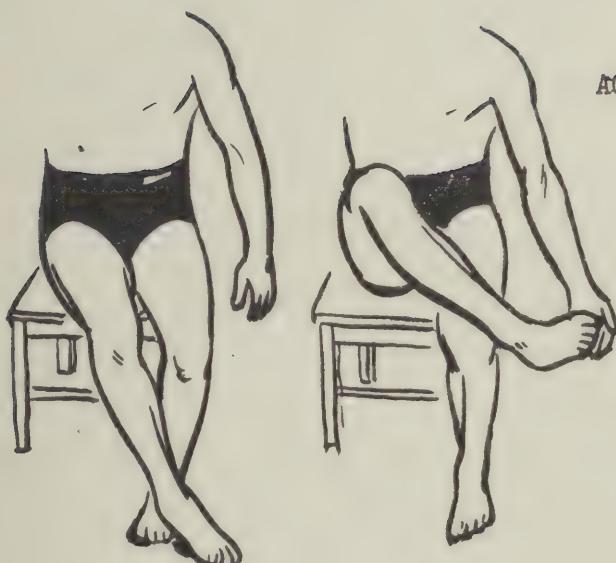
ACTION: 1. Rise on toes on outer borders of feet.
 2. Slowly lower heels to deck and raise inner borders and front of feet off deck, bearing weight on heels.



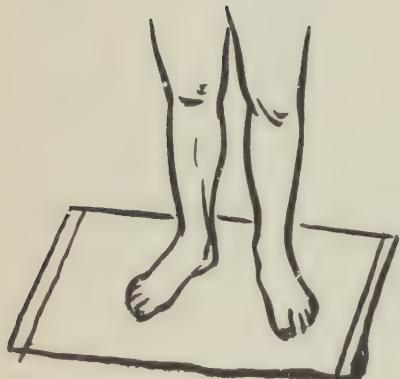
IX.

POSITION: Sitting on a chair with marbles placed six inches to left of toes of left foot.

ACTION: 1. Picking up marbles. Reaching over left foot with right foot, grasp marble with toes of right foot and while keeping toes plantarflexed and foot inverted, raise the right foot to a position to left of left knee where marble is dropped into left hand.
 2. Replace marbles outside of right foot and repeat, toes of left foot picking up the marble.



X.

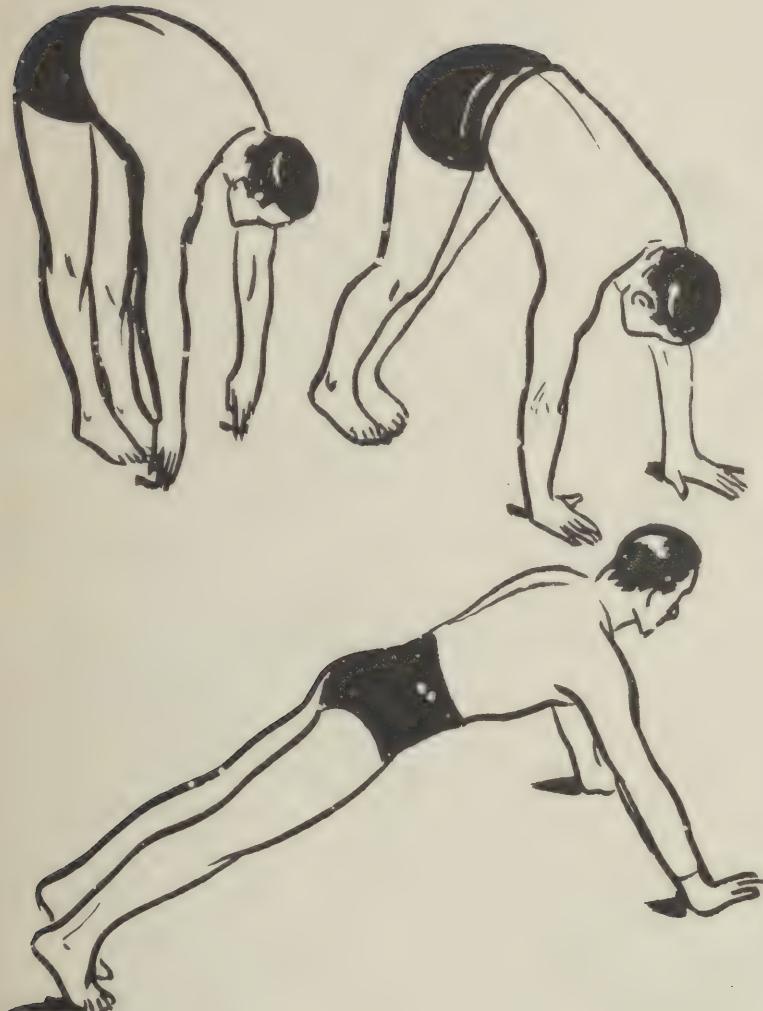


POSITION: Standing or sitting on chair with feet flat on deck and six inches apart with towel under feet.

ACTION: Adduct the feet with toes plantar-flexed, resting weight on heels, and slowly bunch towel between feet.

The following exercises involve the affected part.

XI.



POSITION: Standing with feet together and parallel, body bent so that hands are touching deck in front of feet.

ACTION: 1. By a series of short successive "steps" with the hands, advance along the deck (keeping the heels on the deck as long as possible) until the body is in the prone leaning rest position.

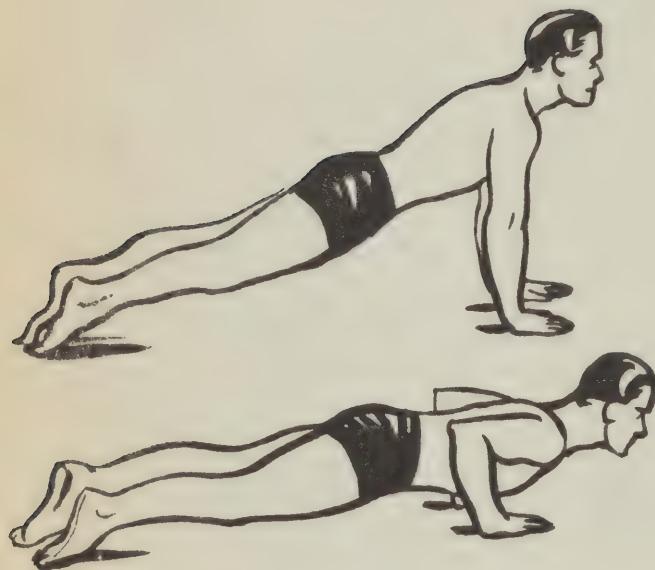
2. By a series of short successive steps with the feet progress toward the hands, trying to place the heels flat on the deck. Steps should not be more than four inches long. Breathe freely.

3-4. Repeat.

XII.

POSITION: Prone leaning rest with weight borne on hands and dorsum of feet. Feet are inverted and toes are planter-flexed.

ACTION: 1. Lower chest to deck.
2. Straighten arms and assume original position.



XIII.

POSITION: Standing with feet four inches apart and weight borne on entire planter surface of feet.

ACTION: Full squat with feet flat on deck throughout.



Further Progression

Upon authority of the ward surgeon such additional activities as the following may be used:

1. Walking around ward on toes with weight borne on outer border of front of foot.
2. Walking in dry sand. A sand box four feet by twelve feet can be used when outdoor facilities do not permit use of beaches.
3. Stationary bicycle.
4. Climbing.
5. Rowing-machine.
6. Swimming.
7. Sport skills (basket-shooting).
8. Shadow-boxing.
9. Hiking.
10. Golf.
11. Sitting relays.
12. Sports which do not involve prolonged running; e.g.,
 - a. archery
 - b. badminton
 - c. handball
 - d. squash.

Note: Well-fitted shoes with even heels should be stressed for all foot and ankle cases. Correct walking (feet parallel) should be emphasized.

If in doubt, consult the doctor.

BACK DISABILITIES

(Compression fractures, low back strains, sacroiliacs,
arthritis, etc.)

Purpose

Overcome muscle weakness.

Strengthen normal function.

I.



POSITION: Lying on back with pillow supporting the under surface of the bent knees.

ACTION: 1. Draw in abdomen, contract buttocks, and exhale.
2. Relax, inhale, keeping abdomen in and chest raised.

II.

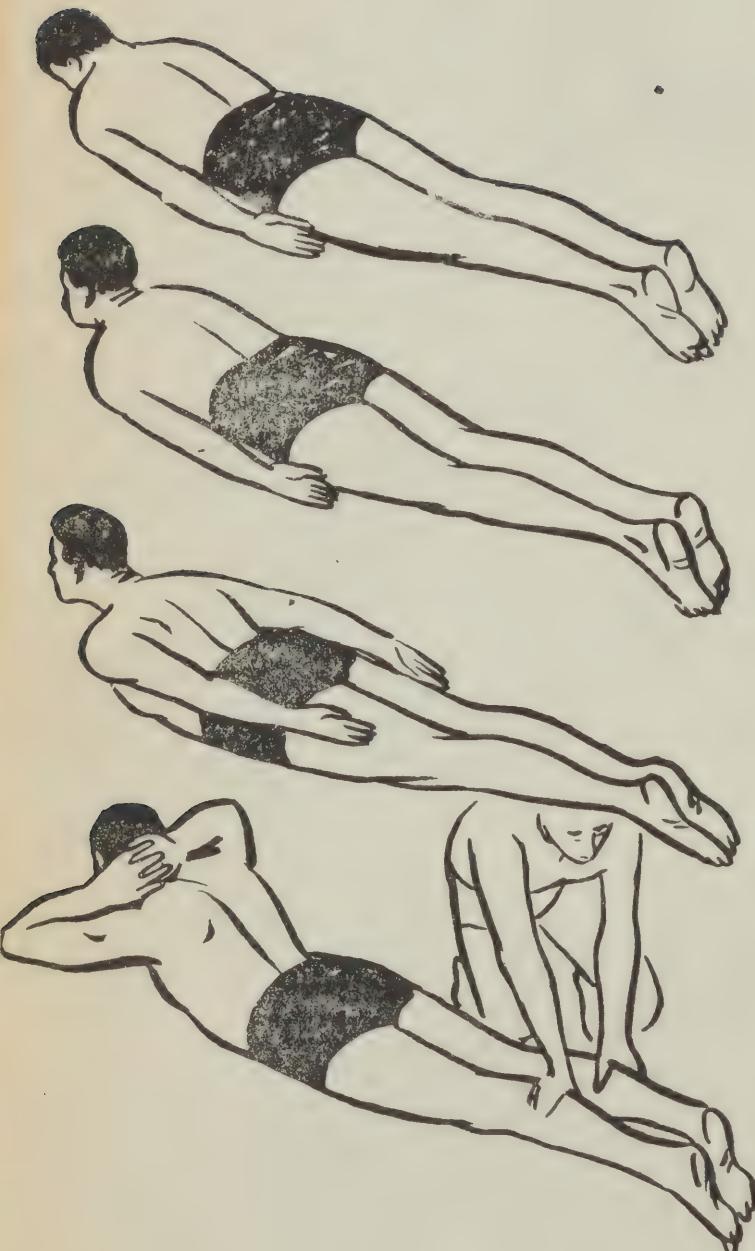


POSITION: Lying on back with pillow supporting the under surface of the bent knees.

ACTION:

1. Straighten knees and point toes downward, resting knees on pillow.
2. Relax.
3. Straighten knees and dorsi-flex toes and extend heels.
4. Relax.

III.



POSITION: Prone lying with hands at sides.

ACTION: Raise head off bed.

Note: For progression:

(a) raise head and shoulders;
(b) with hands at neck firm position, raise elbows, shoulders and head from bed. (Support given at thighs.)

IV.

POSITION: Prone lying.

ACTION: Alternate leg extension.

Note: For progression, extend both legs.



V.

POSITION: Prone lying.

ACTION: Raise head and shoulders and legs from bed.



The following exercises involve the affected part.

VI.



POSITION: Lying on back with hands at neck firm position, knees bent with heels about 18" apart, feet resting near buttocks.

ACTION: Slowly press down with elbows raising hips into a "bridge position."

Note: For progression: place fists at sides of head, and raise hips and trunk into a "bridge position." (See III for group four, page II-4.)

VII.



POSITION: Supine lying, hands at sides.

ACTION: Raise alternate leg approximately one foot off bed.

Note: For progression, keep heels off bed throughout exercise.

VIII.



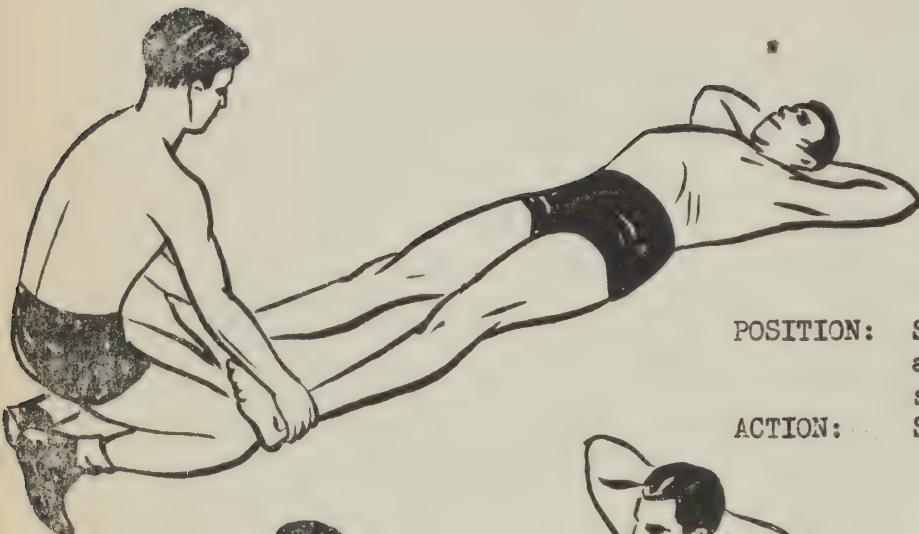
POSITION: Lying face down across bed with weight on legs and thighs, trunk bent down over side of bed. With support at the thighs and calves, raise trunk to a position parallel with deck.

ACTION:

Note: For progression, have hands (a) at neck firm, (b) at side shoulder level, (c) overhead in line with trunk.



IX.



POSITION: Supine lying with hands at neck firm position, supported at ankles.
ACTION: Sit up.



II

X.



POSITION: Supine lying with legs spread 18 inches.
ACTION: Sit up and place feet on hips.

XI.

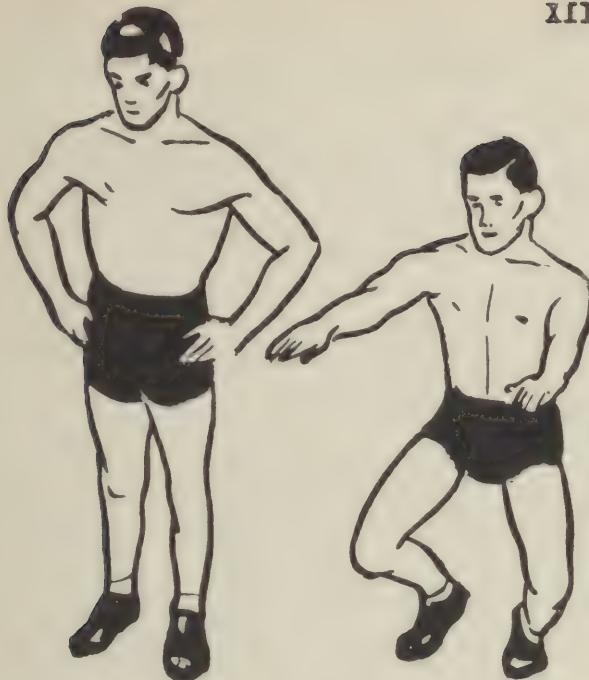


POSITION: Sitting with legs apart, back straight, and arms at side shoulder level, palms up.

ACTION: Twist trunk to right, front, to left, front.

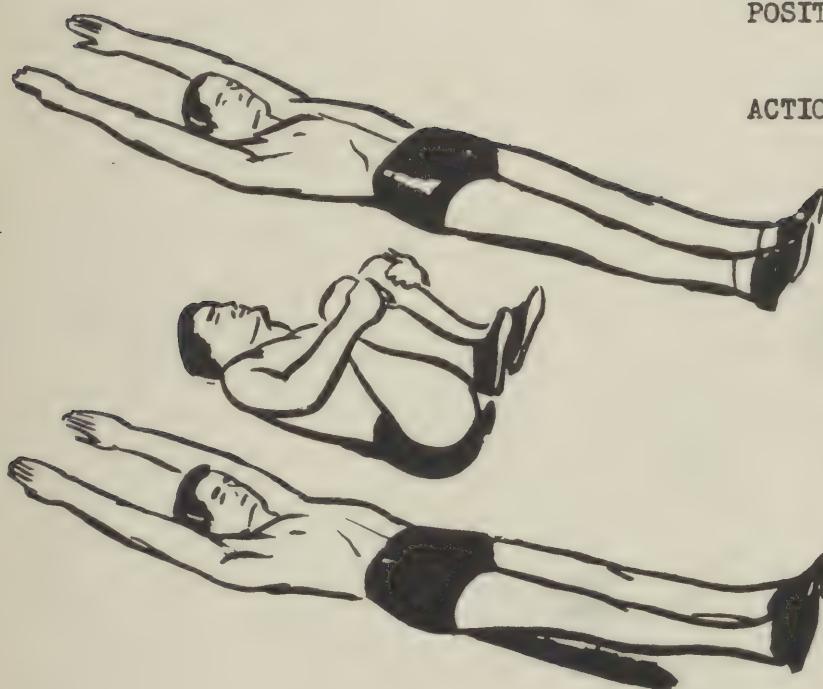


III.



POSITION: Standing with hands on hips.
ACTION: Squat to $\frac{1}{2}$ or $\frac{3}{4}$ squat and extend arms to front shoulder level.

XIII.



POSITION: Supine lying with hands above head in line with body.
ACTION: 1. Draw both knees toward chest and clasp knees with both hands.
 2. Extend legs with heels one foot off deck and stretch arms above head in line with body.

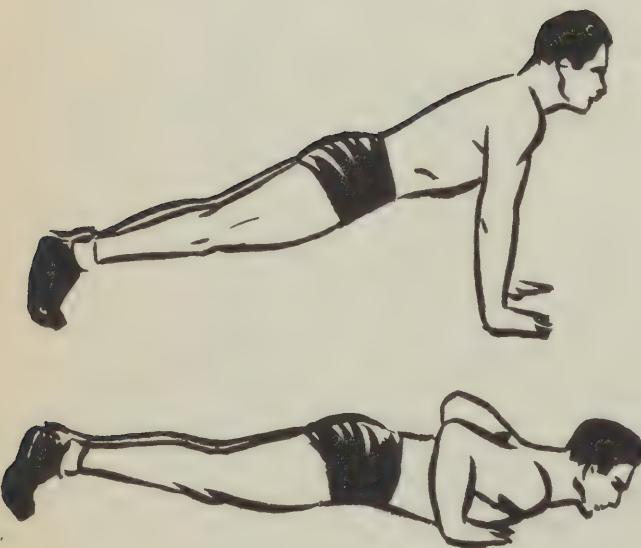
XIV.



POSITION: Standing, stationary walk.

ACTION: Lift knees as high as possible without pain or discomfort.

XV.



POSITION: Prone leaning rest.

ACTION: 1. Lower chest to deck.
2. Straighten arms and assume original position.

Further Progression

Upon authority of the ward surgeon such additional activities as the following may be used:

1. Rowing.
2. Rope-skipping.
3. Wall exerciser: facing machine with one foot forward, arms above head, bend forward and reach toward toes.
4. Flutter kick in swimming.
5. Moderate weightlifting. (No jerks, but slow presses with weight not over fifty pounds.)
6. Sport skills - basket-shooting.

Note: Activities involving "sudden" body movements must be avoided. Constant emphasis should be placed on the correct pelvic tilt and good foot posture.

If in doubt, consult the doctor.

EXERCISES FOR CARDIACS

(Group IV)

(Sedimentation rate normal, no hemolytic streptococci present)

Important

To be done when the ward medical officer allows patient to exercise.

The number of repetitions for each exercise will be prescribed by the ward medical officer.

Observe the following CAUTIONS:

Exercise at a slow cadence.

Exhale on effort.

Take sufficient rest between exercises.

STOP BEFORE any signs of shortness of breath or any other symptoms of circulatory embarrassment appear.

How to Use the Exercises: Have patient

Learn them all by name.

Perform them correctly and in the order prescribed.

Purpose

To overcome ~~cardiac~~ respiratory disability.

I. BACK-FLATTENER

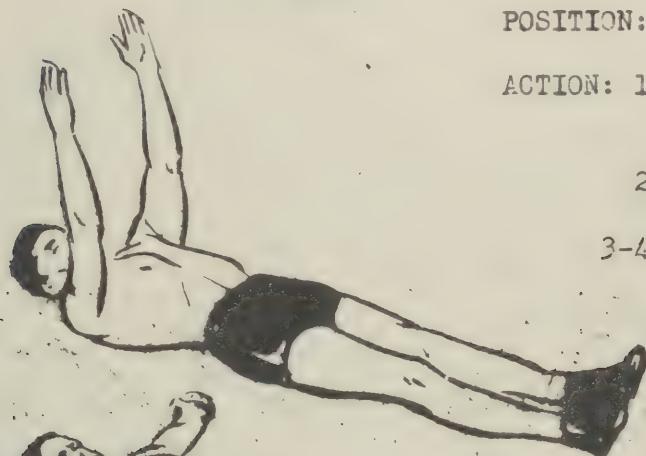


POSITION: On back, knees partially drawn up, arms at sides.

ACTION:

1. Exhale slowly and draw abdomen inward fully.
2. Recover.
3. Inhale slowly and raise chest as high as possible, pressing slightly with arms against bei.
4. Recover.

II. CHEST-EXPANDER

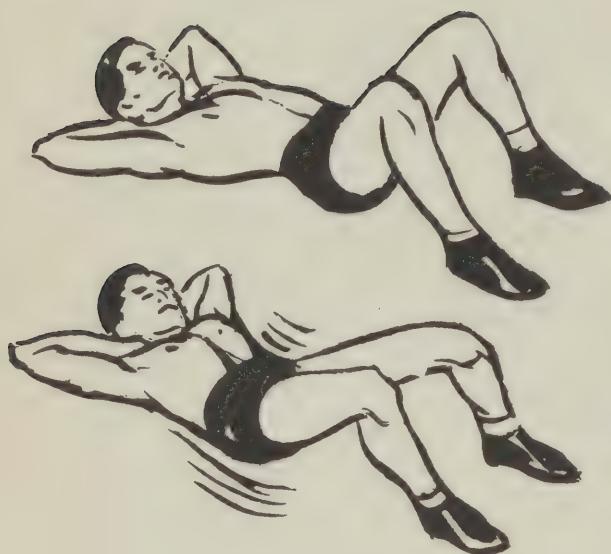


POSITION: On back, arms forward.

ACTION:

1. Inhale deeply as arms move to side shoulder level.
2. Recover, exhaling fully.
- 3-4. Repeat.

III. RHUMBA



POSITION: On back, fingers laced behind head, feet drawn up near hips about one foot apart.

ACTION:

1. Lift hips, swinging them far to the right.
2. Lift hips, swinging them far to the left.
- 3-4. Repeat.

IV. STRONG ARCHES



POSITION: On back, arms at sides.

ACTION:

1. With legs straight, flex feet toward body (dorsi-flexion) and exhale.
2. Stretch toes away from body (plantar-flexion) and inhale.
- 3-4. Repeat.

Note: Keep inside borders of feet together throughout exercise.

V. KNEE-BENDER

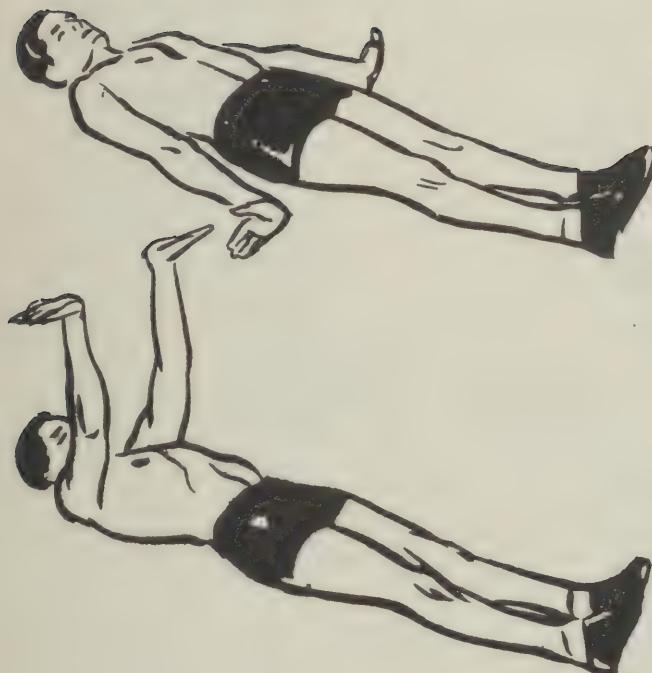


POSITION: On back, arms at sides.

ACTION:

1. Pull left knee to chest, exhaling fully.
2. Recover, inhaling moderately.
3. Repeat 1 with right knee.
4. Recover, inhaling moderately.

VI. WRIST-STRETCHER



POSITION: On back, arms at sides.

ACTION:

1. Flex and extend wrists hard four times with arms at sides.
2. With arms forward, repeat.
3. With arms side-ward, repeat.
4. Recover.

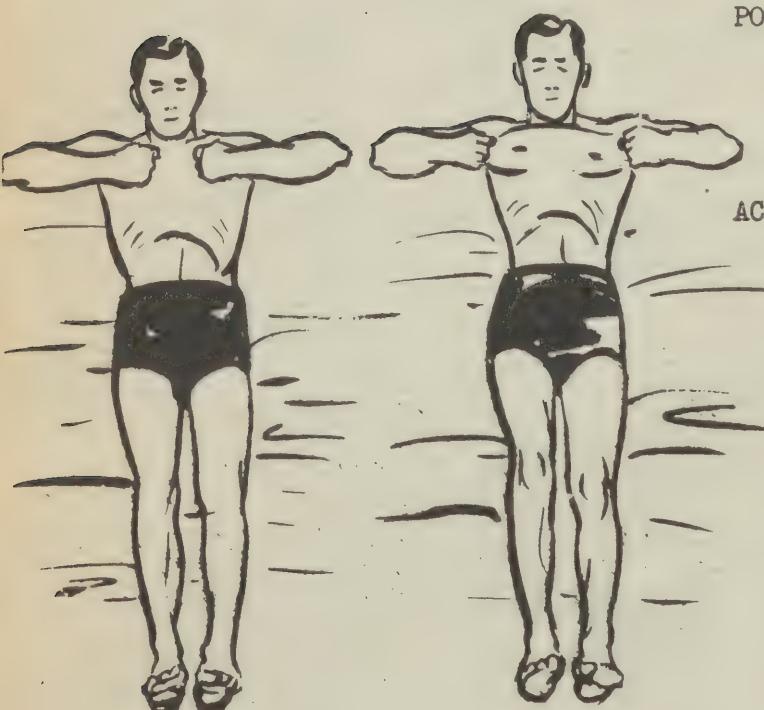
VII. SIT-UPS



POSITION: On back, arms at sides, feet under covers.

ACTION: 1. Sit up until fingers touch lower legs and exhale.
 2. Recover and inhale.
 3-4. Repeat.

VIII. BREAKING CHAINS



POSITION: On back, elbows raised sideward off the bed, fists clenched in front of shoulders.

ACTION: 1. Pull elbows back hard, pressing hard against the bed, and exhale.
 2. Relax.
 3. Pull again.
 4. Relax.

IX. KICK AND STRETCH



POSITION: Lying on right side with right hand supporting head.

ACTION: 1. Swing left leg forward along the bed as left arm is swung to the rear.
2. Swing left leg downward and backward as left arm is swung forward and above head in line with body, inhaling with the movement.
3-4. Repeat.

Note: Repeat the exercise on the left side.

X. RIB-STRFTCHER



POSITION: On back, knees fully bent, hands at sides of bed about one foot from sides of body.

ACTION: 1. Lift chest, stretching far to left.
2. Recover.
3. Arch back and raise chest high.
4. Recover.

Note: On second repetition lift chest to right. On third repetition to left, and so on.

Note: Rheumatic fever cases are often febrile for four to six weeks or longer, must rest in bed until quiescent stage is reached (one to six months), and gradually resume activity, all before full recovery can be anticipated.

The first exercises given in bed are usually light breathing exercises, flexion and extension of extremities, and some very mild resistance exercises. The exercises listed above are the progression for the period AFTER the patient has been conditioned by the breathing, flexion and extension of extremities and resistance exercises.

The number of repetitions for each exercise must be small at the start. Four to six would be considered adequate. As the patient improves his exercise tolerance, progression can be made by an increase in the repetitions and a decrease in the amount of rest between exercises. The cadence should be continued slow.

If in doubt, consult the doctor.

EXERCISES FOR CARDIACS
(Group III)

Important

To be done when the ward medical officer permits.

The number of repetitions for each exercise will be prescribed by the ward medical officer.

Observe the following CAUTIONS:

Exercise at a slow cadence.

Exhale on effort.

Take sufficient rest between exercises.

Move slowly from the lying, to sitting, to standing positions.

STOP BEFORE any signs of shortness of breath appear.

How to Use the Exercises: Have patient

Learn them all by name.

Perform them as correctly as possible and in the order prescribed.

Keep a record of his daily progress.

Purpose

To increase cardio-respiratory efficiency.

To develop strength and endurance.

I. RIB-STRETCHER



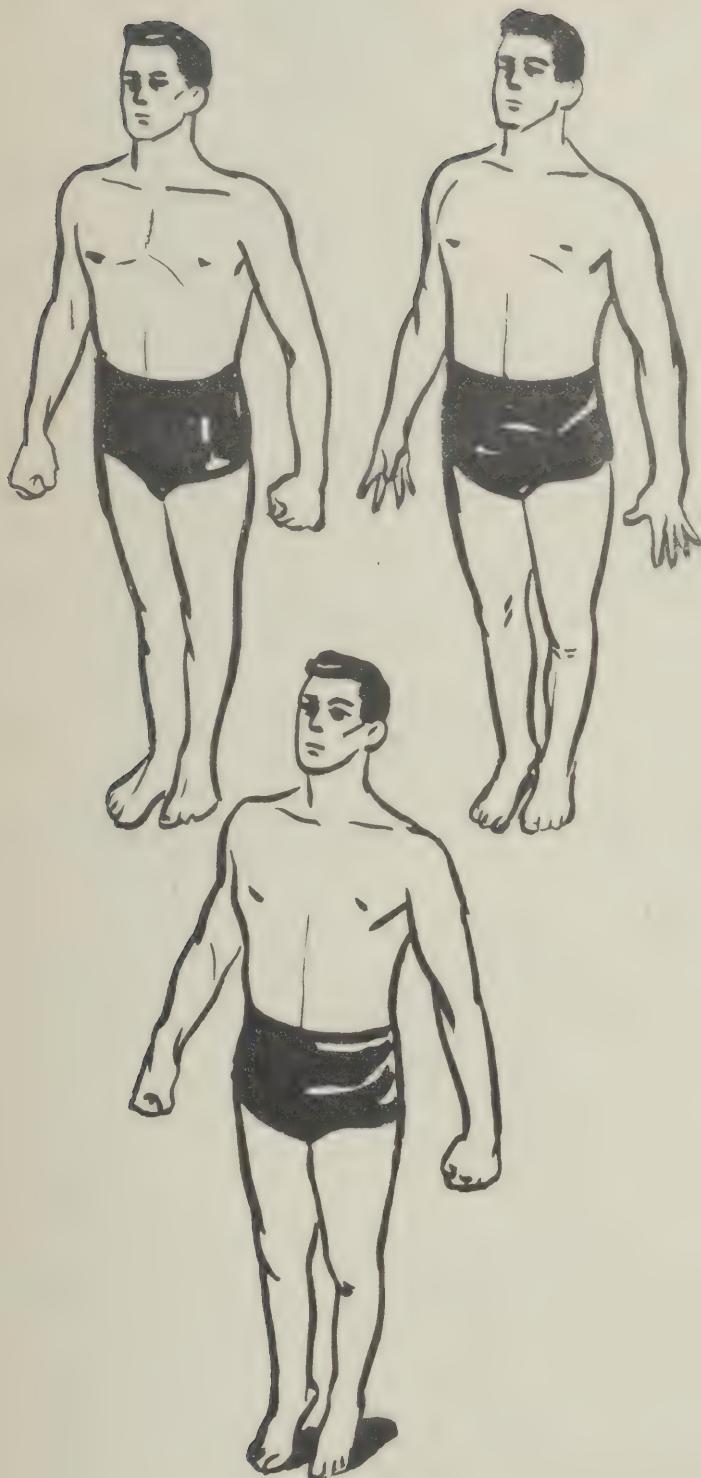
POSITION: Standing, hands on abdomen.

ACTION:

1. Exhale in four counts, pushing out more air each time.
2. Inhale in four counts, attempting to inhale more on each count.

3-4. Repeat.

II. FINGER-STRETCHER



POSITION: Attention.
ACTION: 1. Clasp fingers tightly and stretch them as far as possible, repeating three times. Then, gripping fingers. rise high on toes. Recover.
2. With arms forward, repeat three times. Repeat on toes.
3. With arms side-ward, repeat three times. Repeat on toes.
4. Recover.

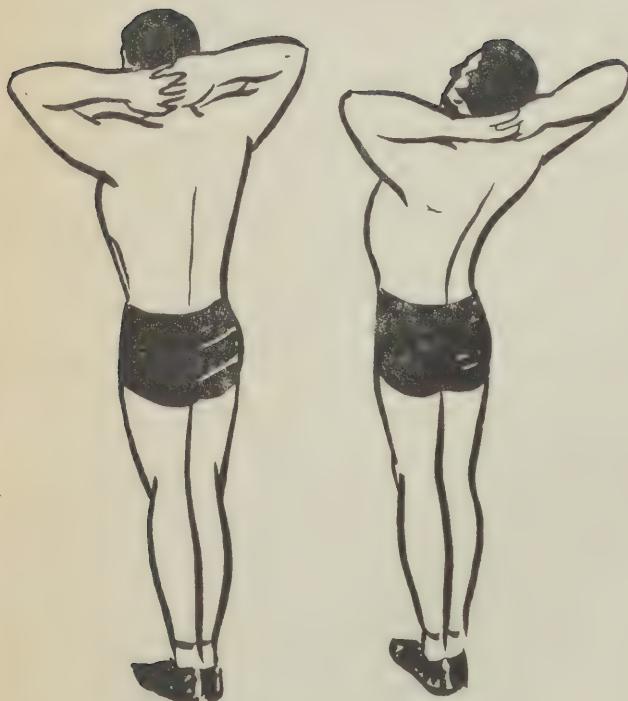
III. KNEE-BENDER



POSITION: On back, arms at sides.

ACTION: 1. Pull left knee hard to chest, exhaling fully.
 2. Recover, inhaling moderately.
 3. Repeat 1 with right knee.
 4. Recover, inhaling moderately.

IV. CHEST-EXPANDER



POSITION: Erect, fingers laced behind head.

ACTION: 1. Raise chest high and inhale, pulling head backward against hands, elbows back.
 2. Recover and exhale.
 3-4. Repeat.

V. SIT AND TOUCH



POSITION: On back, feet separated about two feet, hands on top of thighs

ACTION: 1. Raise head and shoulders from mat, touching right hand to left knee, slightly raising straight left leg. Exhale on effort.

2. Recover and inhale.

3. Repeat to opposite side.

4. Recover and inhale.

VI. SQUAT AND CURL



POSITION: Attention.

ACTION: 1. Full knee bend, flexing elbows, hands just in front of shoulders. Exhale on downward movement.

2. Recover and inhale.

3-4. Repeat.

Note: Movement must be done to a slow cadence.

VII. PRONE LEG-RAISING



POSITION: Prone, head supported on hands with elbows flexed.

ACTION:

1. Raise left leg backward with knee straight, and exhale.
2. Recover.
3. Repeat 1 with right leg.
4. Recover.

VIII. TURN AND BEND



POSITION: Side straddle,
arms at side
shoulder level.

ACTION:

1. Turn trunk to left and bend, touching hands to ground outside of left foot, and ex-hale.
2. Recover and inhale.
3. Repeat to opposite side.
4. Recover and inhale.



IX. CLIMBER



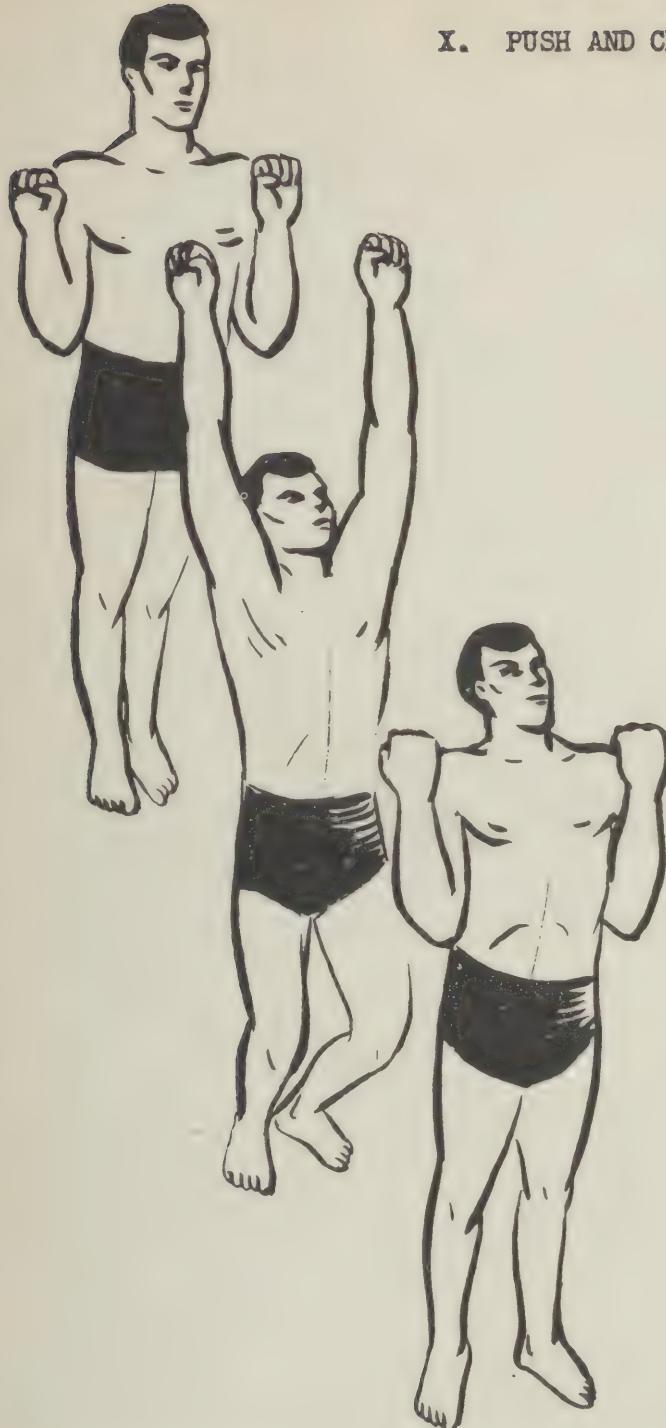
POSITION: Attention.

ACTION: 1. Execute first step of stationary walk, lifting right knee to hip height and swinging arms normally, and inhale.

2. Execute second step, raising left knee, continuing to inhale.

3-4. Repeat, but exhale for the two counts. Try to work up this exercise into an easy jog of about one minute's duration. Exhale freely throughout.

X. PUSH AND CHIN



POSITION: Erect, arms flexed forward and palms forward and up as though supporting a heavy weight at the shoulders.

ACTION: 1. With knees slightly bent, go through the motion of pushing a heavy weight over the head and exhale.
2. Reverse position of hands and do an imaginary pull-up, finishing with fists clenched in front of chest, and inhale.
3-4. Repeat.

Note: The number of repetitions for each exercise should be small at the start. Six to eight would be considered adequate. As the patient's exercise tolerance improves, progression can be made by increasing the number of repetitions and decreasing the length of the rest periods between exercises. Cadence should be SLOW.

ELBOW, WRIST AND HAND DISABILITIES

(Elbow dislocations with some ankylosis, Colle's fracture, hand and finger injuries with nerve involvements)

Overcome muscle weakness.

Strengthen normal function.

I.

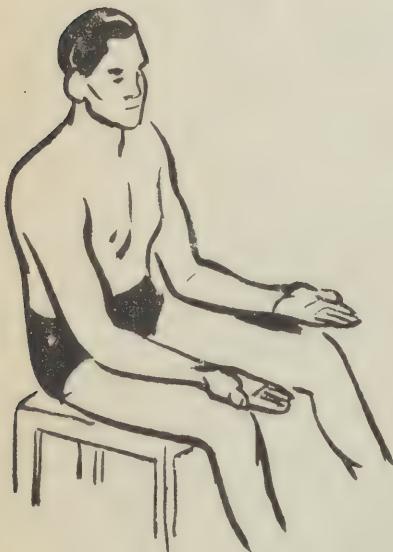


POSITION: Sitting, with forearms resting on thighs.

ACTION: Pronate and supinate the hands.

Note: For progression, one-pound dumbbells may be used.

Standing or sitting, move wrist through normal movements except in the plane of the original injury; e.g. if extensor communis digitorum is "torn," avoid flexion of wrist. Abduction, abduction and extension may be given.



II.



POSITION: Standing or sitting.
ACTION: Spreading and closing of fingers.

III.



POSITION: Standing or sitting.
Hold ball in affected hand.
ACTION: Wind yarn into a ball.



IV.



POSITION: Standing or sitting.

ACTION: Flexion and extension of elbows.

Note: For progression, use one-pound dumbbells.

V.



POSITION: Standing two feet away from wall, palms of hands against wall at shoulder height.

ACTION:

1. Lower chest toward wall by flexing the elbows and extending the wrists.
2. Carefully push away from wall by extending elbows (elbow cases and lumbricales paralysis or claw hand) or by flexing fingers (hand and wrist cases).

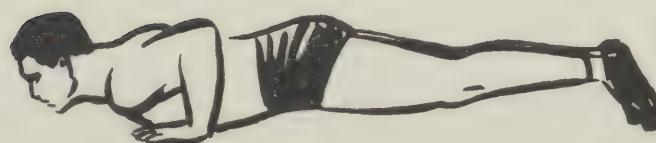
VI.



POSITION: Front leaning rest.

ACTION:

1. Lower chest to deck.
2. Straighten arms to original position.



Further Progression

Upon authority of the ward surgeon such additional activities as the following may be used:

1. Rope-spinning.
2. Rope-skipping.
3. Racquet games, using unaffected hand.
4. Bait- and fly-casting, using affected hand.
5. Pulley-weights. Weights are used to give resistance to the desired movement. An activity that "carries" the part into the desired position is preferred to a less meaningful "exercise." In pulley-weight activities the object is to "raise" the weight to a desired height. To accomplish this the arm is flexed or extended for the purpose of raising the weight. Attention is diverted from the affected part to the carrying out of the objective with freer movement resulting than by the use of "flexion and extension" exercises.
6. Turning a door knob.
7. Wrist machine (flexion and extension of wrist).
8. Rowing.
9. Throwing - darts, a volleyball, basket-shooting.
10. Badminton.
11. Weightlifting (not over fifty pounds and usually not before the fourth to sixth week following the original injury. Five- or ten-pound dumbbells are often used about the fourth week.)
12. Stall bars, facing machine and gripping bar at shoulder height. Activities such as squatting while gripping the bar provide uncomplicated, normal and desirable muscle action.
13. Squeezing a rubber ball or hand grip (spring exerciser).
14. Typing for wrists and especially for fingers.

Note: Activities involving "sudden" movements of the elbow or wrist must be avoided. Slow steady movements should be used. Activities which place the joint in the position in which the injury was sustained are contraindicated. If in doubt, consult the doctor.

HIP DISABILITIES

(Fractures, dislocations, etc.)

Purpose

Overcome muscle weakness.

Strengthen normal function.

I.



POSITION: Lying on back with pillow supporting the under surface of the bent knees.

ACTION: 1. Draw in abdomen and contract buttocks, and exhale.
2. Relax, inhale, keeping abdomen in and chest raised.

II.



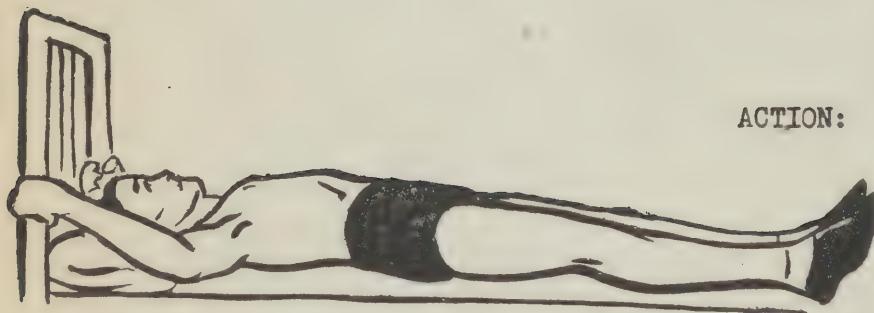
POSITION: Lying on back with pillow supporting the under surface of the bent knees.

ACTION:

1. Straighten knees and point toes downward, resting knees on pillow.
2. Relax.
3. Straighten knees and dorsi-flex toes and extend heels.
4. Relax.



III.



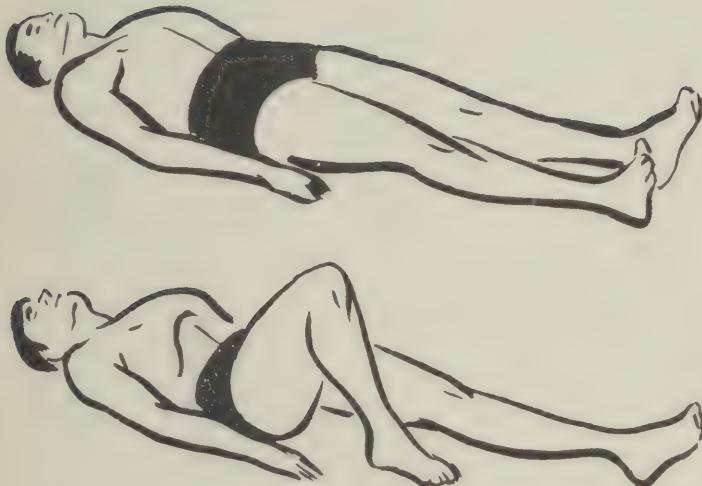
POSITION: Lying on back, hands grasping sides of head of bed about 8" above mattress.

ACTION: Press hands down on sides of head of bed, lifting head and shoulders slightly from the bed.

Note: This movement is made, not by contraction of the abdominal or thigh flexor muscles, but by using the trapezius and rhomboid.



IV.



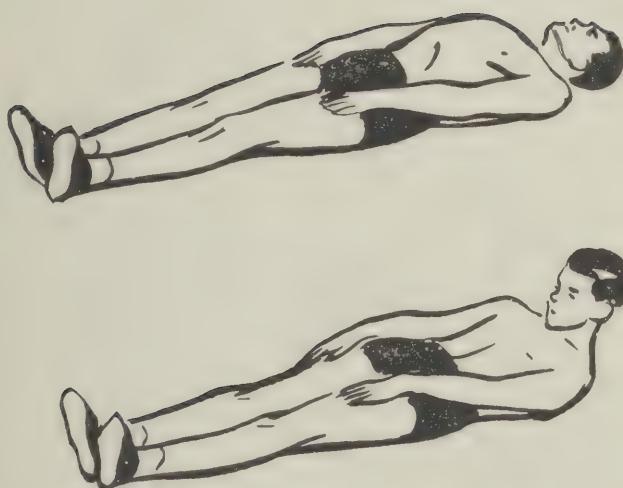
POSITION: Lying on back.

ACTION: 1. Slowly slide heel of right foot toward buttocks, exhaling and drawing in abdomen while contracting buttocks.

2. Slowly straighten knee by sliding heel toward foot of bed.

3-4. Relax and repeat with left leg.

V.



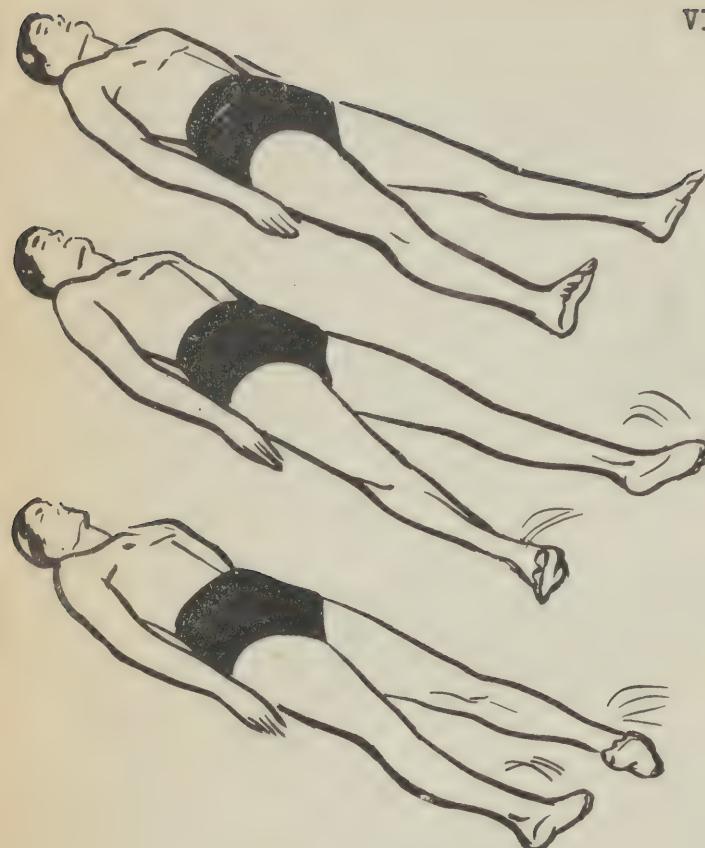
POSITION: Lying on back with hands on thighs.

ACTION: 1. Pull in abdomen, raise head and shoulders slightly off bed and slide finger tips toward knees as breath is blown out.

2. Relax.

3-4. Repeat.

VI.



POSITION: Supine lying with feet 18" apart.

ACTION: 1. Rotate thighs outward.
2. Rotate inward.

Note: For progression, apply light resistance to the movements.

The following exercises involve the affected part:

VII.



POSITION: Supine lying with hands at neck firm position, legs straight.

ACTION: 1. Slowly press down with elbows, raising upper back off bed.
2. Recover.

VIII.



POSITION: Same as VII, except knees are bent.

ACTION: Slowly press down with elbows, raising hips, back and shoulders off bed.

IX.



POSITION: Same as VIII, with fists at sides of head.

ACTION: Raise body to a "bridge" position, supporting weight on hands and feet.



X.

POSITION: Lying on unaffected side.

ACTION: Slowly circumduct thigh of affected side.



XI.

Same as X, taken in standing position. Weight is borne on unaffected side.



XII.

POSITION: Prone lying.
ACTION: Alternate leg extension.



XIII.



POSITION: Standing.
ACTION: Stationary walk with high knee action.

XIV.



POSITION: Standing, hands on hips.
ACTION: Knee bend to half-squat.

XV.

POSITION: Lying on back.
ACTION: Alternate leg raising.

Note: For progression
 keep heels off deck throughout exercise.



Further Progression

Upon authority of the ward surgeon the following additional activities may be used:

1. Rowing.
2. Rope-skipping.
3. Pulley-weight exercise: facing machine with one foot forward, arms above head, bend forward and reach toward toes.
4. Swimming, using flutter kick.
5. Moderate weightlifting. (No jerks, but slow presses with weight not over 50 lbs.)
6. Sport skills - basket-shooting.

Note: Activities involving "sudden" body movements must be avoided. Constant emphasis should be placed on the correct pelvic tilt and good foot posture.

If in doubt, consult the doctor.

KNEE DISABILITIES

(Arthritis, semi-lunar cartilages, sprains,
"trick knees," etc.)

Purpose

Overcome muscle weakness.

Strengthen normal function.

Note: Knee and foot cases should not be allowed to stand in slippers. Regular G. I. shoes should be worn to encourage parallel or slightly pigeon-toed gait to relieve strain on internal lateral ligaments.

I.



POSITION: Sitting or lying in bed.

ACTION: "Patella setting." Contract quadriceps extensor muscles, drawing patella upward and extending knee.

III.

POSITION: Standing on towel.

ACTION: 1. Resting weight on heels, plantarflex feet and by a gripping action of toes, scrape towel to a position between feet.

2. Relax and repeat until towel is completely bunched between feet.



III.



POSITION: Standing with feet parallel, using bed for support if necessary.

ACTION: 1. Rise on toes.
2. Recover.
3. Drop to heels, dorsi-flexing the feet.
4. Recover.



IV.

POSITION: Lying supine with hands at neck firm position.

ACTION: Alternate leg-raising with knee straight, foot dorsi-flexed, inverted, and toes held in plantar-flexion (curled away from body).



Note: Heels should be kept off bed or deck if possible. This exercise can be made more difficult by resting ankle of unaffected leg upon ankle of affected leg and giving slight resistance to the raising of the affected leg.

V.

Same as number IV but raising both legs at the same time.

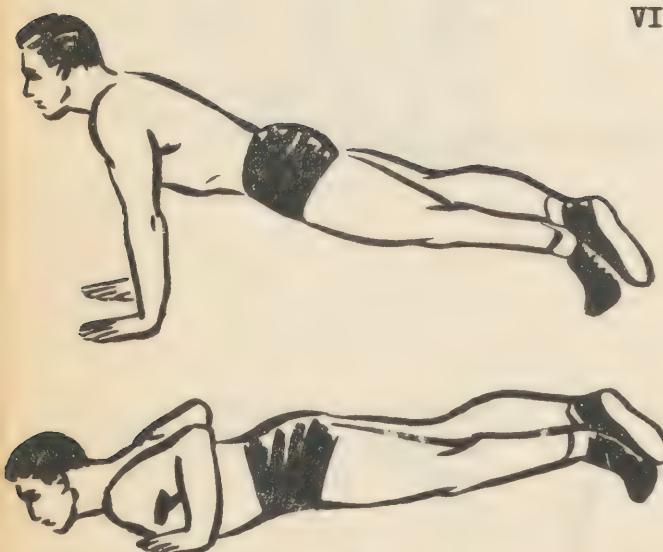


VI.



POSITION: Supine or prone.
ACTION: "Flutter kick"
as in swimming.

VII.



POSITION: Prone leaning
rest.
ACTION: 1. Lower chest to
deck.
2. Push to prone
leaning rest
position.

Note: Affected leg may be
placed across back of
unaffected leg at first.

VIII.

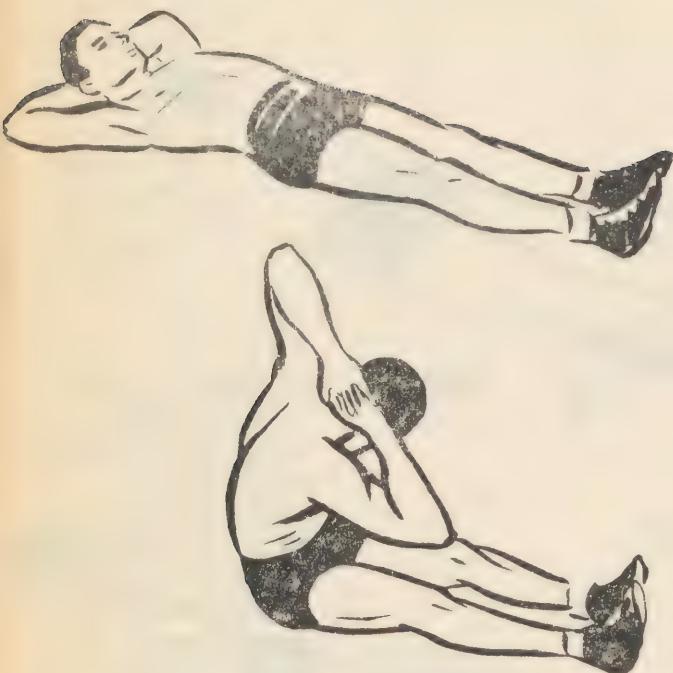


POSITION: On back. Arms side shoulder level with palms down, holding light medicine ball, or semi-inflated basketball or volleyball between knees.

ACTION: Raise legs to vertical position.

Note: For progression, describe figure-of-eight movement with legs.

IX.



POSITION: On back with hands at neck firm position.

ACTION:

1. Come to a sitting position and touch right elbow to left knee.
2. Recover to original position.
3. Sit up, touch left elbow to right knee.
4. Recover.

Note: Throughout this exercise keep feet dorsi-flexed, inside borders of feet held together, toes plantar-flexed and knees straight.

X.



POSITION: On back with hands on hips.

ACTION:

1. Come to a sitting position and spread legs apart keeping knees straight, heels off deck and feet dorsi-flexed and inverted.
2. Close legs and lower body to deck.

The following exercises involve the affected part.

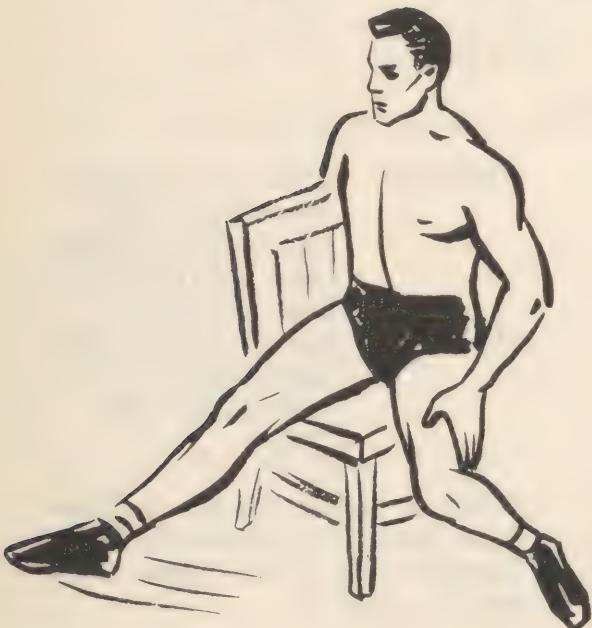
XI.



POSITION: Sitting on edge of bed or chair with affected leg hanging over the side of the chair.

ACTION: Straighten affected knee, relax and repeat.

Note: For progression, a sandbag or weight can be placed on the foot of the unaffected knee for resistance.





XII.

POSITION: Lying on back with legs raised, toes pointing toward ceiling, knees straight.

ACTION: 1. Slowly flex knees to a position within the arc of pain.
2. Recover.

Note: Some pain should be considered necessary for recovery of knee function.



XIII.



POSITION: Lying with palms under buttocks and legs straight, toes pointing toward ceiling.

ACTION: Slowly go through movements of pedalling a bicycle.

Note: Extreme flexion of the knee should be avoided. Flexion should be "into the arc of pain."

Further Progression

Upon authority of the ward surgeon such additional activities as the following may be used:

1. Riding on stationary bicycle.
2. One-half squat using stall bars.
3. One-half squat without use of stall bars.
4. High step stationary walk.
5. Rowing machine.
6. Swimming (no diving).
7. Walking on tip toes with feet parallel.
8. Stair-climbing.
9. Basket-shooting and other sports skills.

Note: Activities involving "sudden" change of foot position must be avoided. Movements which place the joint in a position of strain must be avoided until full recovery. Correct foot posture is very important in all knee cases.

If in doubt, consult the doctor.

PILONIDAL CYSTS

Following an operation for pilonidal cyst, exercises must be given with care not to bear weight on the wound or scrape the affected part. The supine position for exercise is possible if the hands are placed under the hips to raise the affected parts from the bed. Hip flexion tends to stretch the wound and should be avoided.

Purpose

To maintain general body tone without aggravating the affected part.

I.



POSITION: Lying on back with knees bent, a pillow or palms of hands lifting the body off the affected area.

ACTION: 1. Draw in abdomen, contract buttocks and exhale.
2. Relax, inhale, keeping abdomen in and chest raised.

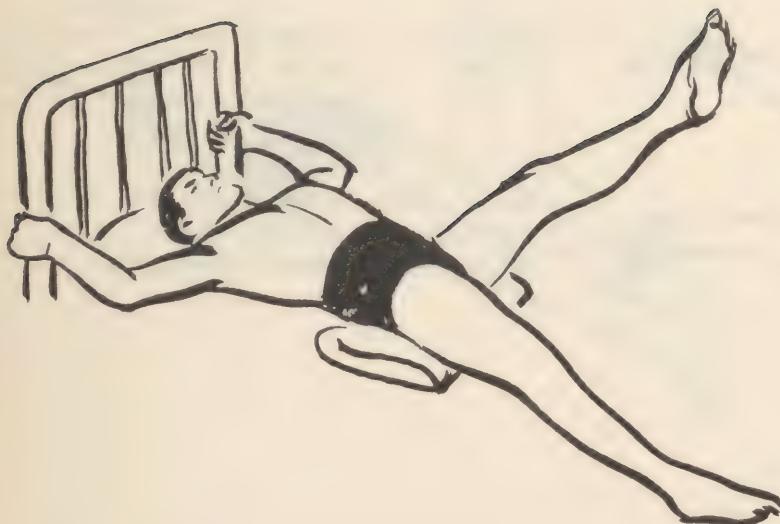
II.



POSITION: Lying on back, a pillow lifting body off the affected area, hands grasping the sides of the head of the bed about 8" above the level of the mattress.

ACTION: Push down toward the mattress with the hands, lifting the head and shoulders slightly from the bed. Some assistance can be given by pressing down with the heels.

III.



POSITION: Lying on back, a pillow lifting body off the affected area, hands grasping the sides of the head of the bed about 8" above the level of the mattress.

ACTION: 1. Raise left leg to a 45° angle
2. Lower to bed.
3-4. Repeat with right leg.

IV.



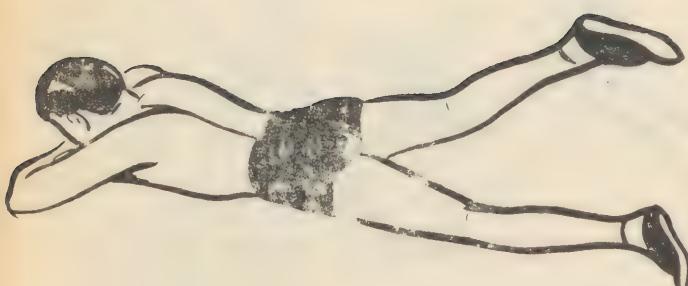
POSITION: Sitting, or lying with pillow doubled and placed under the knees.

ACTION:

1. Straighten knees and point toes toward foot of bed.
2. Relax.
3. Straighten knees and extend heels while vigorously dorsi-flexing feet.
4. Relax and repeat.



V.



POSITION: Prone lying.

ACTION: Raise alternate legs about one foot off bed.

Note: Keep knees straight and knees and toes clear of bed throughout exercise.

VI.



POSITION: Prone lying.
ACTION: Raise head and shoulders off bed..

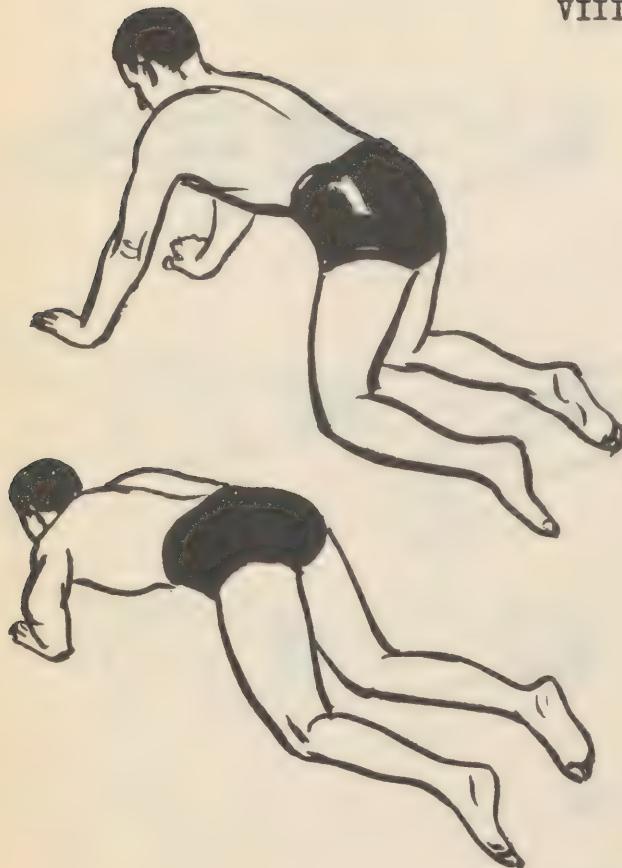
VII.



Same as VI, but with hands at neck firm position.

Note: Support is given at back of thighs.

VIII.



POSITION: On hands and knees with hands directly under shoulders and knees under hips.

ACTION: 1. One-half dip.
Lower chin to a position slightly in advance of fingers and exhale.
2. Return to original position.
3-4. Repeat.

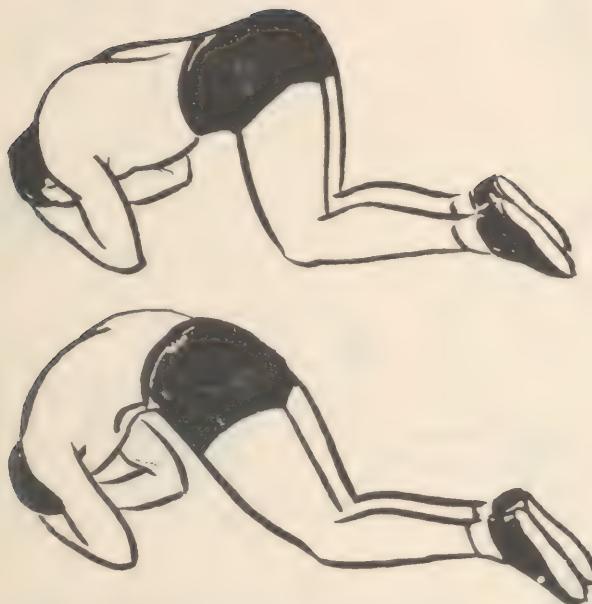
IX.



POSITION: On back with feet above chest, toes pointing toward ceiling and hips lifted with hands.

ACTION: Bicycle movement with legs.

X.

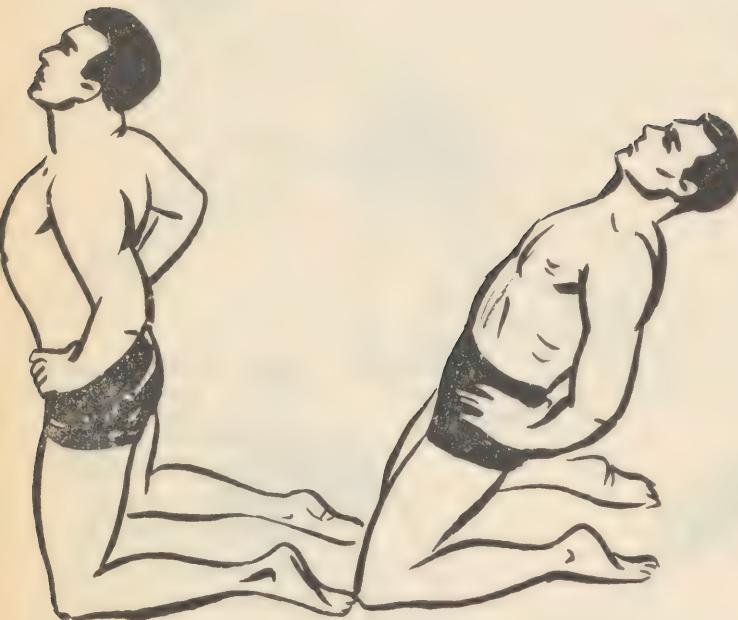


POSITION: Knee chest position. ("Mad cat")

ACTION: 1. Tighten the buttocks, draw in abdomen, round the lower back and exhale.
2. Relax and repeat.

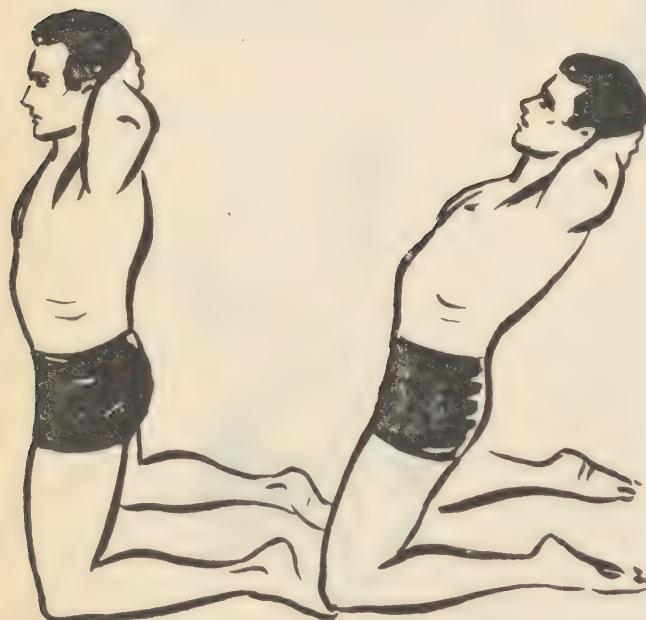
Note: Imagining a cat, "spitting" as it sees a dog, helps to emphasize the drawing in of the abdomen and the raising of the lower back.

XI.



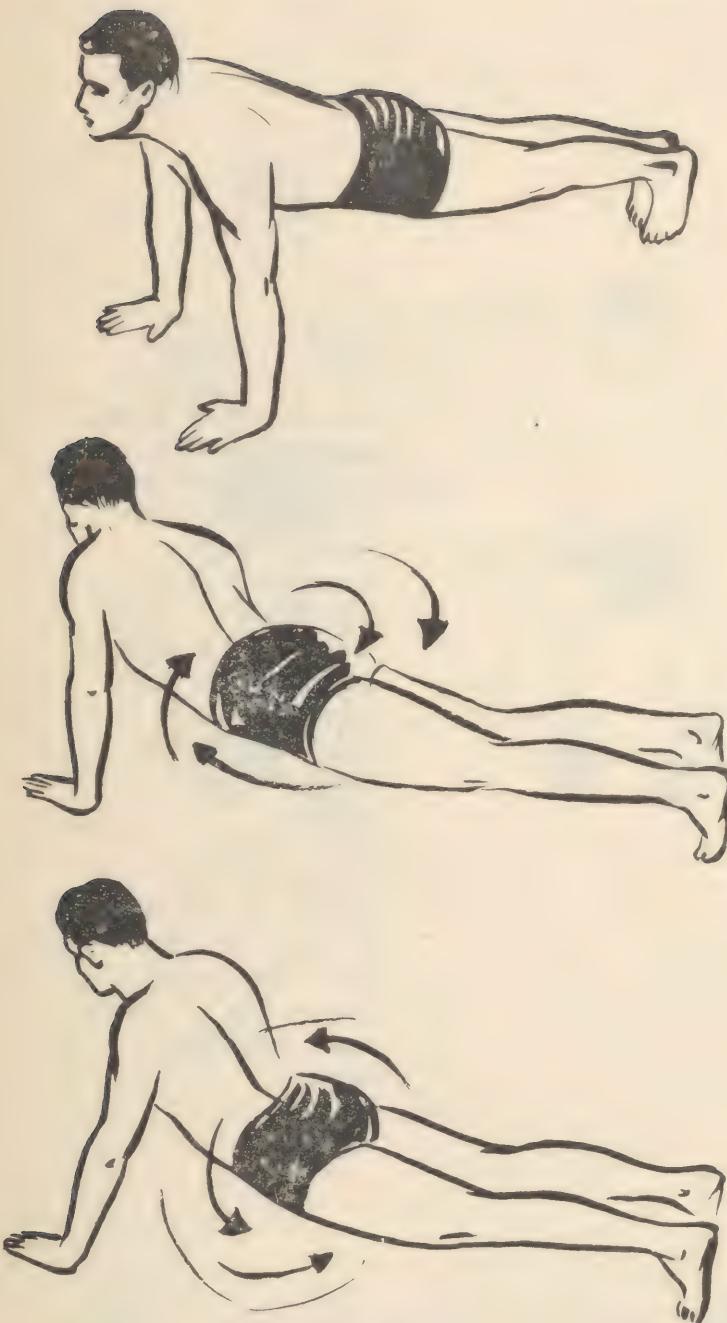
POSITION: Kneeling with trunk and thighs at right angle to deck, hands on hips.
ACTION: Bend backward at knees.

XII.



Same as XI, with hands at neck firm position.

XIII.



POSITION: Prone leaning rest position.

ACTION: Circumduction of hips, first clockwise and then counter clockwise.

XIV.



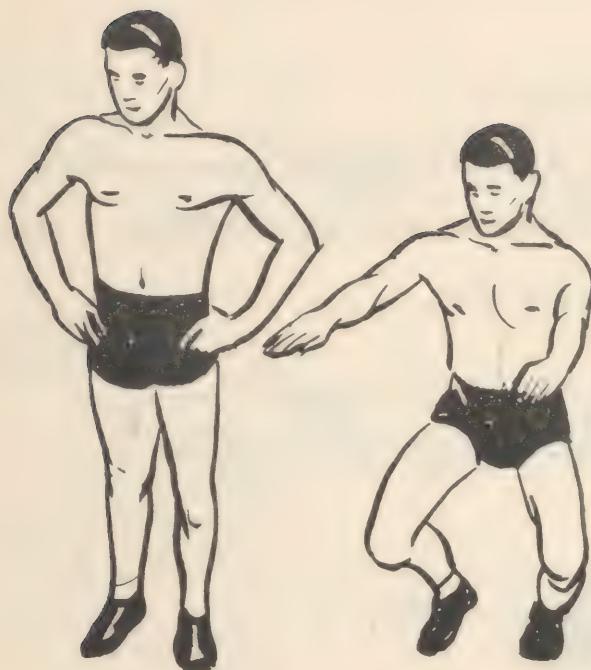
POSITION: Lying on back, palms of hands lifting body off the affected area, knees bent and separated, soles of feet together.

ACTION:

1. Stretch legs downward, pressing soles of feet together as much as possible and dorsi-flexing the feet as the legs are extended.
2. Bend knees, bringing feet upward as close to hips as possible, pressing the soles of the feet together hard.

3-4. Repeat.

XV.



POSITION: Standing, feet 8" apart, hands on hips.

ACTION:

1. Do a $\frac{1}{2}$ or $\frac{3}{4}$ squat on toes and extend arms to front shoulder level.
2. Return to position.
- 3-4. Relax and repeat.

Note: Pilonidal cysts may be very painful. Avoid activities in which patient experiences discomfort during or following exercise. If in doubt, consult the doctor.

POST-ABDOMINAL OPERATIONS

(Appendectomies, herniorraphies, etc.)

Purpose

Overcome muscular weakness.

Improve gastro-intestinal activity.

Re-educate abdominal and lower back "postural" muscles to prevent "abdominal sag" which is frequently associated with the assumption of the erect posture following an abdominal operation.

I.



POSITION: Lying on back with pillows supporting the under surface of the bent knees.

ACTION:

1. Draw in abdomen and contract buttocks, and exhale.
2. Relax, inhale, keeping abdomen in and chest raised.

II.

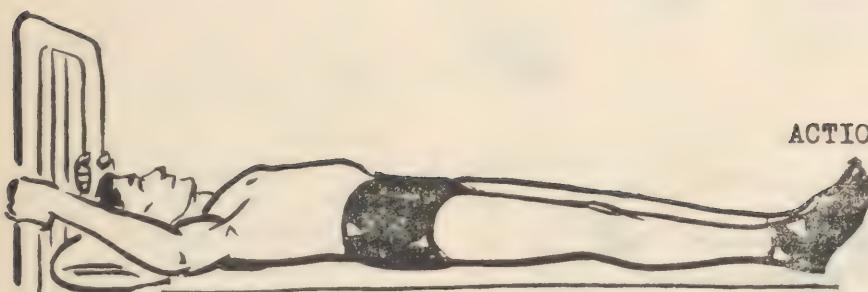


POSITION: Lying on back with pillows supporting the under surface of the bent knees.

ACTION:

1. Straighten knees and point toes downward.
2. Relax.
3. Straighten knees, dorsi-flex toes and extend heels.
4. Relax.

III.



POSITION: Lying on back, hands grasping sides of head of bed about 8" above mattress.

ACTION: Press hands down on sides of the head of the bed, lifting head and shoulders slightly from the bed. This movement is made, not by the abdominal or thigh flexor muscles, but with the trapezius and rhomboid muscles.

IV.



POSITION: Lying on back.

ACTION:

1. Slowly slide heel of right foot toward buttock, exhaling and drawing abdomen in while contracting buttocks.
2. Slowly straighten knee by sliding heel toward foot of bed.
- 3-4. Relax and repeat with left leg.

The following exercises involve the affected part.

V.



POSITION: Lying on back with hands on thighs.

ACTION:

1. Pull abdomen in, raise head and shoulders slightly off bed and slide finger tips toward knees as breath is blown out.
2. Recover.
- 3-4. Repeat.

VI.



POSITION: Lying on back.
ACTION: 1. Bend right knee on abdomen, clasping knee with both hands and exhaling.
 2. Return leg to straight position with heel on bed. Relax.
 3-4. Repeat with left knee.

VII.



POSITION: Lying on back.
ACTION: 1. Draw knees toward chest, assisting by placing hands at back of thighs. Exhale.
 2. Stretch legs toward ceiling.
 3. Bend knees and hips, bringing knees to chest.
 4. Drop heels to bed near buttocks and straighten knees by sliding heels on sheet toward foot of bed.



VIII.



POSITION: Lying on back with abdomen drawn in, backs of hands under buttocks.

ACTION: 1. Raise right leg toward ceiling with knee straight. Exhale.
2. Lower heel to bed.
3-4. Repeat with left leg.

Note: Emphasis must be given to holding abdomen in throughout this activity.

IX.

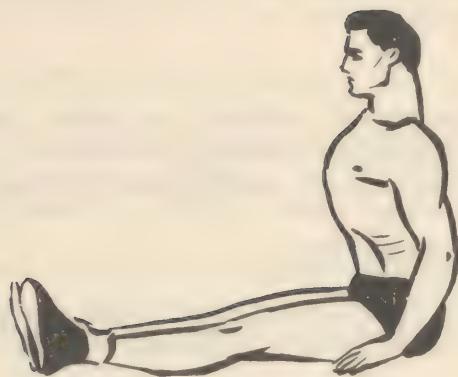


POSITION: Knee chest position. ("Mad cat")

ACTION: 1. Tighten the buttocks, draw in abdomen, round the lower back and exhale.
2. Relax and repeat.

Note: Imagining a cat, "spitting" as it sees a dog, helps to emphasize the drawing in of the abdomen and the raising of the lower back.

X.



POSITION: Lying on back with hands at sides.

ACTION:

1. Lift head and shoulders off bed and draw in abdomen and at the same time raise trunk to a vertical position, exhaling.
2. Lower body slowly to original position.
- 3-4. Relax and repeat.

XI.



POSITION: Lying on back, palms under buttocks, hips raised and knees drawn to chest.

ACTION: Bicycling. Slowly go through the leg movements of pedalling a bicycle, breathing freely and keeping abdomen drawn in.

Further Progression

Upon authority of the ward surgeon, such additional activities as the following may be used:

1. Double leg raising, provided patient can keep lower back on deck and abdomen in throughout entire exercise. (Usually not until after the fourteenth post-operative day.)
2. Push-ups, but no squat-thrusts.
3. Facing wall-exerciser (pulley-weights) with one foot forward. Raising arms above head. Drawing arms to side shoulder level, etc.
4. Punching the light bag.
5. Flutter kick in either prone or supine position.
6. Chinning. (Usually not until the twenty-eighth post-operative day.)
7. Moderate weightlifting of the slow "press" type (30 lbs.).
8. Rope-skipping. (Usually not until the twenty-eighth post-operative day.) Unless the abdominal muscles show good tone, jumping activities are contraindicated.
9. Recreational swimming, but no diving.
10. Individual golf shots; e.g., putting, chip shots, etc.
11. Basket-shooting. (The game itself, due to the sudden and vigorous movements entailed, is contraindicated until the surgeon permits.)

Note: Constant emphasis should be given to correct pelvic posture in all post-abdominal cases to prevent sagging of pubic and inguinal areas.

If in doubt, consult the doctor.

POSTURE

A two-fold approach to the problem of posture development is recognized. First, it is necessary that physical training instructors be always on the alert to recognize and correct improper carriage wherever they see it. But in most cases it becomes necessary to strengthen weak muscles if faulty body mechanics is present.

One exercise is suggested which will be generally valuable in the correction of incorrect posture of the upper part of the body. It is recommended that the exercise be given at the beginning and end of each physical training class. Bluejackets also should be encouraged to take the posture exercise whenever they feel themselves slumping throughout the day.

POSITION: Stand with the fists clenched and held alongside (not touching) the point of the shoulders. The elbows are bent and held close to the body. The abdomen is pulled in and up, the lower back flattened, and the gluteals contracted.

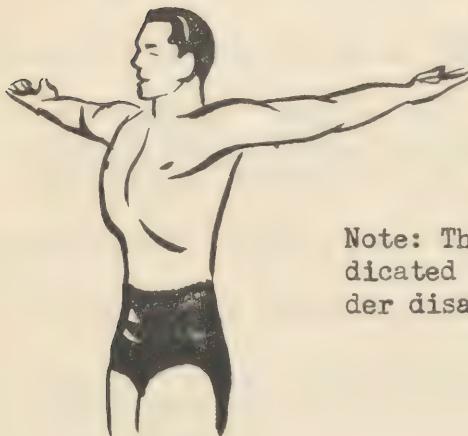
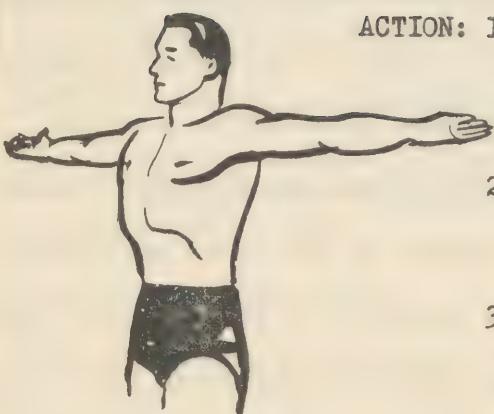
ACTION: 1. Extend the arms to side horizontal, palms up. Stretch out to the side as far as possible. Hold this position for five seconds.

2. Move the arms slightly upward and three or four inches backward. Hold this position for five seconds.

3. Move the arms slightly upward and as far backward as possible, keeping the head back. Hold this position for five seconds.

4. Drop the arms to the side (starting position), being sure to maintain the corrected posture of the upper body. Breathe normally throughout the exercise.

Note: This exercise will be contraindicated at first for those with shoulder disabilities.





Note: Bed patients will profit from simply assuming the starting position of the exercise momentarily while lying in bed. They should be sure that the whole arm and fist are pressed firmly against the bed. The position should raise the chest and improve the posture.

SHOULDER DISABILITIES

(Shoulder dislocations, Nicola's, etc.)

Purpose

Overcome muscle weakness.

Strengthen normal function.

Note: Physiotherapy takes care of:

- (a) loosening adhesions
- (b) movements aimed at increasing flexibility or range.

I.



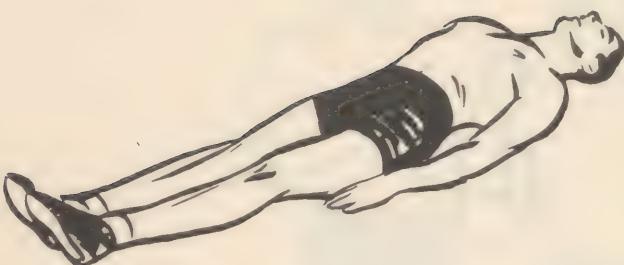
POSITION: Sitting or lying.
ACTION: Rotate head to right and left side against imaginary resistance.

II.

POSITION: Lying.

ACTION: Press head back

against pillow
with an arching
of the upper thor-
acic and cervical
regions.



III.

POSITION: Standing or sitting
with trunk bent
forward 90°, affected
arm hanging loosely
downward towards
deck.

ACTION:

"Stirring the pot."
With the shoulder as
the point of the cone
describe the base of
a 12"-diameter cone.
(If the right arm is
the injured one, the
movement should be
in a counter-clock-
wise direction.)
For left arm, move
clockwise.



Note: Arm swings in an almost
passive movement, "relaxed
shoulder motion." The other
hand may be rested on a table
for support if desired.

IV.



POSITION: Standing or sitting. Forearms flexed with fists clenched in front of shoulders.

ACTION: Press elbows against the sides of chest.



V.



POSITION: Standing or sitting with forearms flexed across front of chest, fist of affected shoulder in palm of the other hand.

ACTION: Press fist against palm with resistance.

VI.



POSITION: Standing or sitting. Wrist of affected side is grasped by other hand.

ACTION: Pull elbow of affected side away from body against mild resistance.

VII.



POSITION: Standing.

ACTION: 1. Rotate arms inward.
2. Relax to mild outward rotation.
3-4. Repeat.

Note: For progression hold five- to ten-pound dumbbell in each hand.

The following exercises involve the affected part.

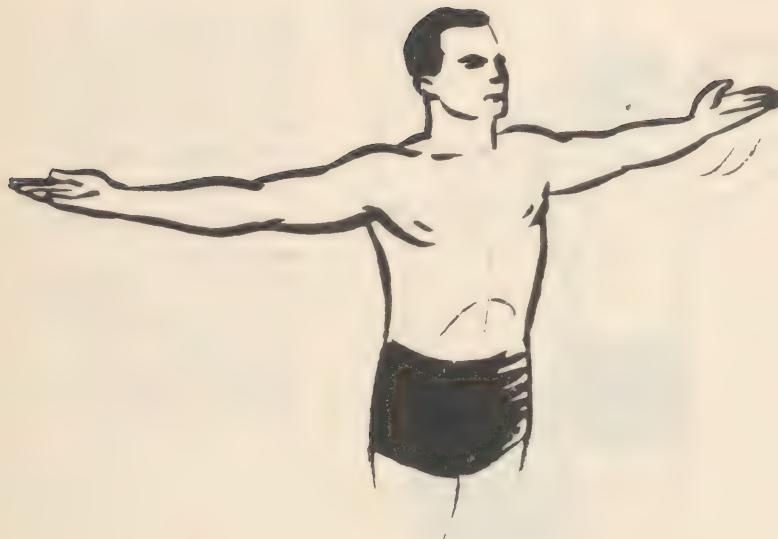
VIII.

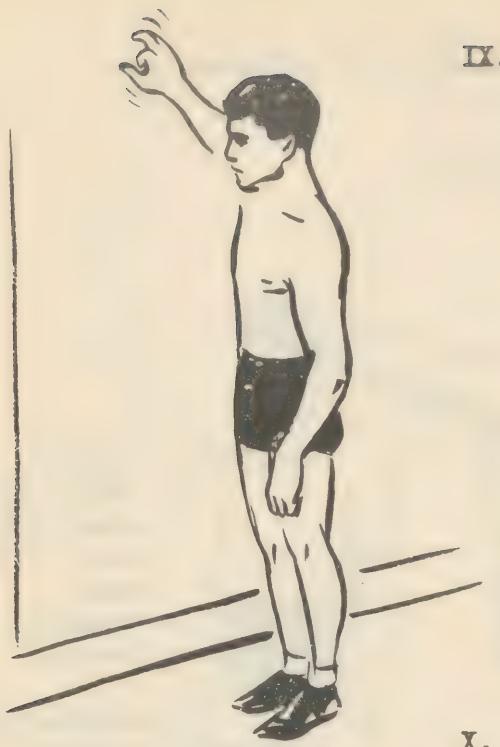


POSITION: Standing or sitting. Arms at side shoulder level with palms down.

ACTION: 1. Supinate hands.
2. Return.

Note: For progression use a five-pound dumbbell in each hand.





IX.

Finger climbing up wall.
Use wall finger-board if
one is available.

X.



POSITION: Place hands at shoulder level against the wall and feet about 18" away from the wall.

ACTION:

1. Lower chest toward wall.
2. Slowly straighten arms and by a flexion of fingers push away from wall.

XI.



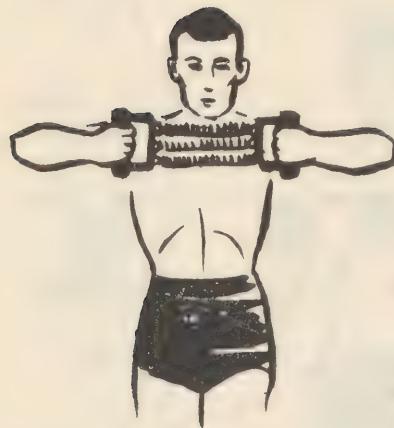
POSITION: Standing with forearms flexed with five-pound dumbbells held in front of shoulders.

ACTION: 1. Push hands above head.
2. Lower hands to chest.



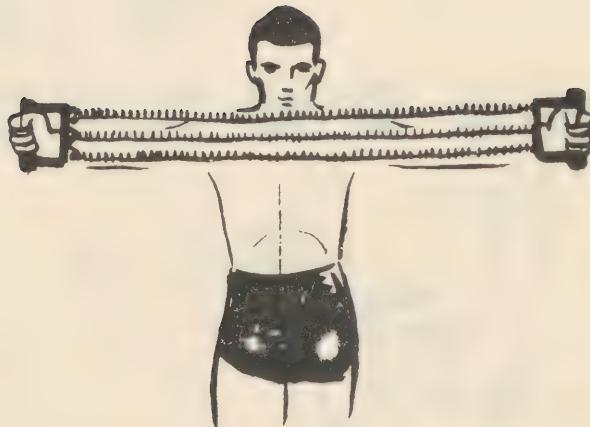
Note: For progression use ten-pound dumbbells.

XII.



POSITION: Hold extension cables in front of chest.

ACTION: 1. Stretch arms out to side shoulder level.
2. Return.



Further Progression

Upon authority of the ward surgeon such additional activities as the following may be used:

1. Push-ups. Usually not before the twenty-first post-operative day.
2. Chinning. Usually not before the twenty-first post-operative day.
3. Rope-skipping ("crosses")
4. The rowing-machine.
5. Facing stallbars with hands at front shoulder level (squatting).
6. Punching the light bag.
7. Shooting baskets (the game itself is contraindicated until surgeon permits).
8. Badminton.
9. Indian-club swinging.
10. Moderate weightlifting (thirty pounds).
11. Side-stroke swimming.
12. Jog-running.

Note: Activities involving "sudden" or "arm-flinging" movements must be avoided. Activities which place the joint in the position which originally caused the injury must be avoided.

A patient with a shoulder disability is not "sick" in the ordinary sense of the word. His response to vigorous exercise is good, as long as the affected part is protected. Therefore, exercises such as leg-raising for the abdominals and hip flexors can be given in heavy doses. The psychological satisfaction which comes from having taken a vigorous work-out without hurting the shoulder is an example of good mental therapy.

PART III. PHYSICAL TRAINING METHODS AND PROCEDURES

In order to guide physical training personnel in the administration of their program, the following principles are suggested:

1. Hospital Regulations and Routine

It should be the responsibility of the physical training officer to acquaint himself and his staff with the local hospital regulations. A few of the items to be considered are:

- (a) When is field day? This is an established event in all Naval hospitals. Patients' schedules must be planned with full consideration for field day.
- (b) When is sick call? It has priority over other activities.
- (c) What are the meal hours? This must be taken into consideration in arranging the schedules.
- (d) What work details are scheduled? In the hospital a certain amount of work must be done, much of which is performed by patients. If they were not used, it would be necessary to expand ship's company inordinately. The patient's day is arranged to permit the completion of the work detail as well as the prescribed physical training and other clinical activities.

2. Know Your Hospital

The ultimate goal of the Rehabilitation Program can best be

achieved only through the teamwork of the entire hospital staff. In order that physical training may supplement the other services, it is necessary that physical training personnel understand the aims and purposes of physical therapy, occupational therapy, educational services, civil readjustment, Red Cross, and welfare and recreation. This understanding can prevent unnecessary overlapping of services.

On the other hand, different forms of treatment designed for a common purpose often accelerate recovery. For example, a patient with a disability of his hand which makes finger flexion difficult may receive manipulation in physiotherapy, and in occupational therapy he may be assigned a project which necessitates the grasping of a tool with his affected hand. Knowing what is being attempted in this instance, the physical training instructor may suggest badminton as an activity which can be adapted to the patient's need. The badminton racket, weighing only seven ounces, may have the handle taped to make it larger so that it may fit more easily into the patient's hand. The combined efforts of physiotherapy, occupational therapy and physical training are thus working toward a common goal - increasing the power of finger flexion of the affected hand.

The relationship between the physical instructor and the patient is usually of a type which frequently causes the patient to express himself in terms of his hopes, desires and ambitions. Knowing what the educational services have to offer, the physical training instructor may guide some patients, who previously showed no interest in education, to a phase of

education in which they now exhibit a definite interest. Problems necessitating the services of the chaplain or the Red Cross are often revealed in casual conversation with the instructor who can direct representatives of these services to the patient.

An understanding of the nurse's function in the ward can be very helpful to physical training personnel. The nurse directs the scheduling of treatments and maintenance. Every effort should be made to adapt the physical training program in order that there will be a minimum of interference with her duties. Patients should be encouraged not only to improve their own bodies through exercise but to improve their immediate surroundings by habits of neatness and cleanliness. The cooperative spirit which is sought in the exercise program should be urged in other patient activities within the ward. The physical training instructor will be successful in his contact with patients to the extent that, through his example and in his actual teaching, he is able to instill in them a zest for living implemented by a positive effort toward recovery.

Hospital corpsmen have tasks which should be understood by the physical training personnel. These corpsmen are responsible for the ward work. A spirit of helpfulness to corpsmen on the part of patients should be encouraged in every way possible. The proper attitude of the physical training instructor toward corpsmen, whether or not he holds a higher rating than they, will contribute to a cooperation of personnel through which work will be done smoothly and promptly. Naturally,

physical training personnel will be expected to stand administrative or other watches to which they may be assigned as part of hospital routine.

The physical training officer must know his own staff - their background and experience, their special skills and abilities, any emotional quirks, and any personal or family problems. This will help not only physical training but the entire program. These experiences and traits should be carefully considered when assigning instructors to the different groups.

A thorough inventory of available facilities for physical training is important, particularly where climatic conditions make outdoor exercise impractical during part of the year. The physical training officer should cover the entire compound, checking both indoor and outdoor areas for possible physical training space. In addition, the areas in the immediate vicinity of the compound should be checked for supplementary space.

3. Analysis of Patient-Situation

In order to insure a total coverage of patients in a comprehensive program of physical training, it will be necessary to conduct a careful analysis of their number, classification, and types of disabilities. Much valuable information may be secured by the alert physical training officer in making rounds with the ward medical officer.

4. The Physical Training Instructor

Health is always an asset, but in working with the sick and wounded it is a necessity. The hours are long, and the work is exacting. More-

over, if the instructor is to be effective in his teaching, he must himself be a good example of health and general fitness. He should maintain good posture and military smartness. His dress should always be neat and clean and appropriate to the occasion.

He should be enthusiastic and optimistic about his work. Teaching those who have made a more or less serious sacrifice in the defense of their country should be a privilege. Each instructor should keep this thought foremost in his mind while working with his patients. The reward for work well done will be the satisfaction which will come through noting the patient's improvement in physical condition and morale.

The instructor's approach to patients in the hospital is quite different from that used in coaching an athletic team. The interest inherent in sports may not be present in some of the other activities of the rehabilitation program. Some patients may not be aware of the benefits which they can receive from performing prescribed exercises. These patients will need careful orientation to understand the values of these exercises. However, the instructor with a pleasing personality and a pleasant smile rarely finds difficulty in guiding this type of patient. This is the quality of friendliness seen in many doctors whose very presence is a tonic to patients.

Instructors who have been successful coaches may find that patients experience some difficulty in acquiring new neuromuscular coordinations. Many of these patients have never been taught the basic sports skills. Consequently simple fundamental movements may have to be repeated over

and over again. The most effective teaching will be dependent upon the degree of patience used in dealing with these persons.

5. Maintaining Patient Morale

Motivation of patients is necessary in order to maintain their morale. At times patients naturally become discouraged. To label a patient "non-cooperative" may be an indication of the instructor's failure to properly motivate the patient. There is no single appeal which will be successful with all patients. Some may be approached on the basis of improving personal appearance; others, because of their desire to be self-supporting. The desire for improvement must be kept alive. The selection of the proper motivating force will be important to the success of the rehabilitation program.

Physical training instructors should point out to patients that their recovery is in large part dependent upon their own efforts. The speed of the patient's recovery will be in proportion to his cooperation with the various means utilized in treatment. It may be helpful to acquaint patients with certain elementary facts of anatomy, physiology, and kinesiology which pertain to the exercises prescribed for them. Patients should understand, for example, that their muscles will weaken with disuse and that a loss of physical fitness accompanies illness and injury. It may be valuable for them to know something about the part which the quadriceps femoris plays in patella setting. Such a knowledge may serve as an inward compulsion to effort which is always more effective than external coercion. However, it may be necessary in a few cases to emphasize the fact that

exercise is a prescription which must be carried out by the patient just as any prescription for medication.

Knowledge of the patient's diagnosis and prognosis as well as of his personal history and "interest chart" will make for better patient-instructor relationships. Such a thing, for example, as the discovery of an interest in a common hobby often develops a rapport which will have a favorable influence upon the speed of recovery. The maintenance of the patient's morale must be considered an important factor in his recovery, and physical training personnel must constantly bear in mind its possible contribution to this end.

6. Specific Teaching Procedures

After the patients' exercises have been approved by the medical officer and the physical training instructor has spent adequate time in orienting the patients to the benefits they will receive from their prescribed exercises, the actual teaching will be started.

The following teaching procedure is suggested for the physical training of a number of group 4 patients who present similar disabilities. After certain necessary introductory remarks by the instructor, the first exercise (the waker-upper) is described by the instructor and demonstrated by one of the patients. All those for whom the exercise is contraindicated are asked to remain inactive. The patients are asked to perform the movement slowly, during which time the instructor goes about the ward correcting any faulty execution. He then demonstrates the alternative exercise, or exercises, which have been prescribed for those

who do not take the regular exercise. These movements are then practiced, under supervision, in a similar manner. Other exercises are learned in the same manner. It is important that exercises are done exactly as only thereby will the expected results be achieved.

As the instructor proceeds with his teaching, he should first start the exercises and establish the cadence and then go about among the group correcting any patients whose performance of the various movements is not correct. It may be advantageous, if possible, to assign two instructors to each physical training class. If this is done, the more experienced instructor should go about encouraging patients and correcting faulty executions while the other stands before the group, demonstrating the exercises and giving the group whatever leadership is needed.

The exercise program in the ward may not, at first glance, meet with the approval of those who are accustomed to unified movements in calisthenics. All patients may not be doing the same exercise; newer patients may be exercising at a slower cadence than those who have been in the ward for some time.

With the ward clear for exercise the instructor starts his class by calling, "All right, Mates, let's start exercise number one." He then moves about the ward, gives any needed assistance to new patients, admonishes the older patients to improve the technique of execution of their exercises, emphasizes the need for improvement in body posture, encourages all patients to exert greater effort to strengthen their feet and leg muscles, and in general motivates the patients to work more vigorously for their own improvement.

Attention must be given to new patients coming into the ward to see that they learn their exercises correctly. They will learn a great deal through imitation of other patients, but the instructor will need to give them special attention as he moves about the ward.

If possible it is desirable to orient and teach new patients how to perform correctly their prescribed exercises at a time previous to the regular class period. If this is not practical they may be taught with the regular group.

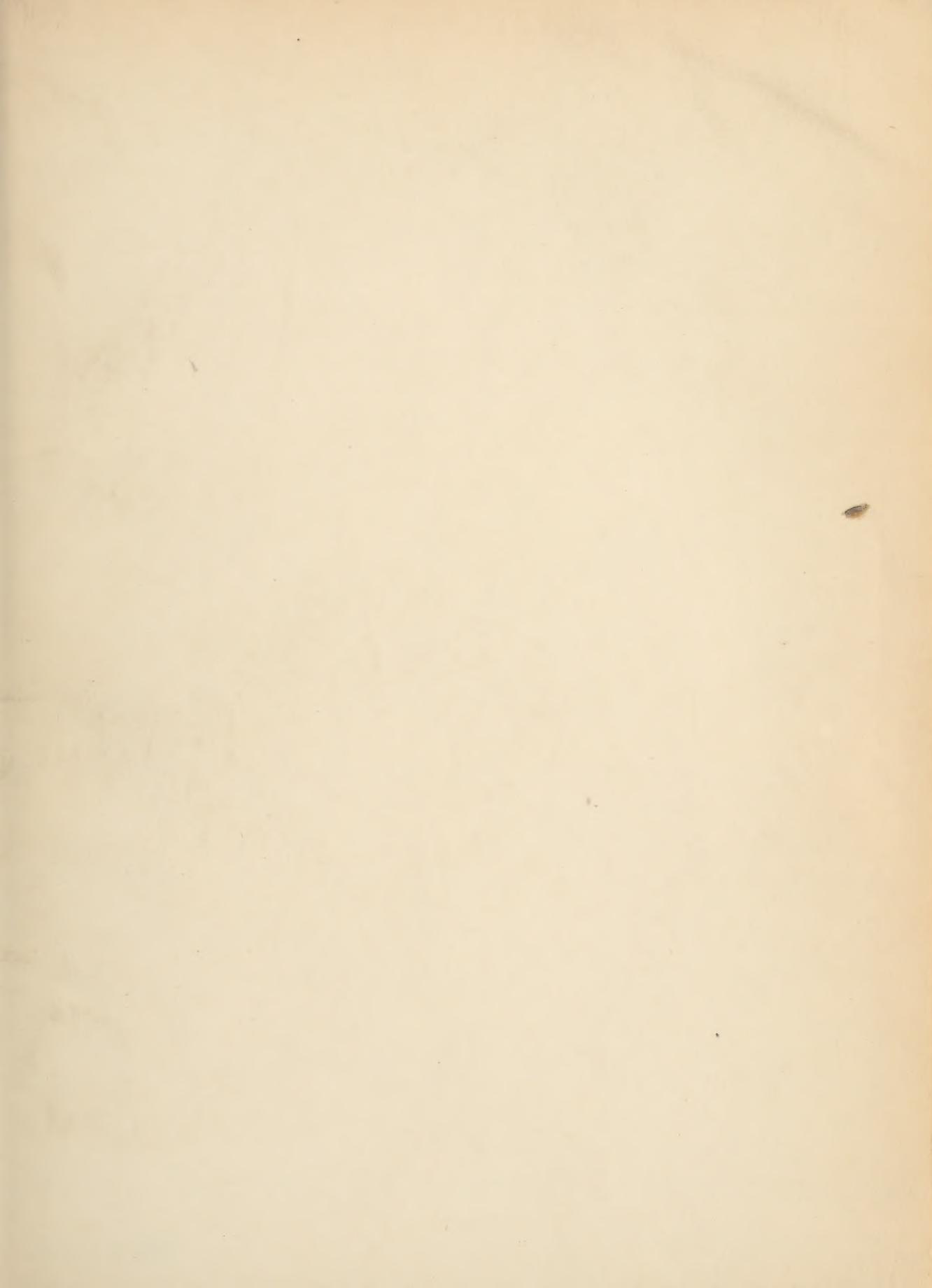
Exercises for group 3 can be taught by using the aforementioned procedures with or without cadence as indicated by the nature of the group. The exercise set approved for group 3 should meet the needs of the majority of patients. Those for whom any exercises in the set are contraindicated are given alternate exercises as described above.

Obviously it is desirable to have homogeneous groupings wherever this is possible; namely, (1) general disability, (2) neck, head, arm and hand, (3) leg and foot, (4) abdomen, chest and back.

Exercises for groups 2 and 1 should be taught in the usual manner for calisthenics. Alternate exercises should be given to those who are unable because of any disability to take the regular exercises.

7. Physical Fitness Tests

No standardized physical fitness test for use in hospitals is included as part of the physical training program. Separate test elements may be used provided they are approved for patients by ward medical officers.



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